

Agency for Health Care Policy and Research

Annotated Bibliography

Rural Health Services Research, 1968-90



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Public Health Service
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Introduction

The viability of America's rural health care system is of major concern to Federal and State policymakers. As part of the Federal effort to improve health services in rural areas, the Agency for Health Care Policy and Research (AHCPR), as well as its predecessor, the National Center for Health Services Research and Health Care Technology Assessment, has long supported studies dealing with the organization, financing, and delivery of health care in rural areas. Since 1968, AHCPR has funded over 70 studies and conferences relating to rural and frontier health issues and initiated data analysis on rural health concerns.

This bibliography summarizes the results of past and current AHCPR-supported rural health research and reflects the agency's active and sustained commitment to this field. It is comprised of the results of internal and external research from 1968 to 1990 and includes 127 annotations for both current projects and for completed project findings published as peer-reviewed journal articles, AHCPR reports, and final executive summaries and research reports available through the National Technical Information Service (NTIS). These annotations are arranged alphabetically by last name of principal author. Documents available only through NTIS are cited with the NTIS access number. AHCPR intramural articles are also noted accordingly.

In addition, the bibliography includes an appendix that lists all projects by the year in which they were funded; an author index of all principal and coauthors; and a subject/title index of projects and articles presented alphabetically by title within nine subject headings: access and availability, data and measurement, health manpower, health services research/methodology, hospitals, maternal and child health, primary care (including EMS and alternative care), technology, and utilization and service delivery.

The information presented here was derived from several internal sources. These include abstracts prepared by the project officers of each grant or contract; executive summaries submitted by the project's principal investigator; AHCPR lists of current grants; and bibliographies of all articles either published by AHCPR or in peer-reviewed journals as a result of extramural research or completed by intramural staff. It is our hope that by providing information on AHCPR-supported rural health research, we will stimulate interest in further study of this vital issue.

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List of Acronyms Used in This Report

AHA	American Hospital Association
AHCPR	Agency for Health Care Policy and Research
CHC	Community health center
CPR	Cardiopulmonary resuscitation
CRNA	Certified registered nurse anesthetist
DHHS	(U.S.) Department of Health and Human Services
DRG	Diagnosis related group
EKG	Electrocardiogram (also ECG)
EHSDS	Experimental health services delivery system
EMC	Emergency medical coordinator
EMCRO	Experimental medical care review organization
EMS	Emergency medical services
EPSDT	Early periodic screening, diagnosis, and treatment
HMO	Health maintenance organization
HMSA	Health manpower shortage area
IMU	Index of Medical Underservice
MEDEX	<u>Medecin</u> (physician) extender
MSA	Metropolitan statistical area
NCHSR	National Center for Health Services Research (through 1984); National Center for Health Services Research and Health Care Technology Assessment (1985-89)
NHIS	National Health Interview Survey
NHSC	National Health Service Corps
NMES	National Medical Expenditure Survey
NP	Nurse practitioner
PA	Physician's assistant
PHS	Public Health Service
PPO	Preferred provider organization
PRIMEX	Primary (care) extender

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Completed Reports

- 1. Andersen, Ronald M., and L. Aday. (1979, December). Analysis of a 1975-76 National Survey of Access to Medical Care. (NTIS No. PB85-165843/AS; Contract No. HRA 230-76-0096).**

Data from a national survey sponsored by the Robert Wood Johnson Foundation, the American Hospital Association, and the Health Resources Administration were used to determine indices of access, utilization and appropriateness of medical care among a disadvantaged (rural-urban) population group. Patterns of health practice and certain outcomes including disabilities were ascertained. Possible strategies for improving access and effectiveness of care were identified. Cross-validity analysis for the various data sources on the same subpopulation was performed.

- 2. Barrett, Lawrence T. (1975, July-August). The need for a regional focus in rural health services. Public Health Reports 90(4), pp. 343-356.***

In 1971, the National Center for Health Services Research participated in a conference sponsored by the Farm Foundation. Later a group of representatives from NCHSR, the American Medical Association, the Department of Agriculture, and the Farm Foundation formed a core group to explore ways to integrate rural health studies within a common framework. In this article the author suggests the need for a systematic regional approach toward rural health care delivery.

- 3. Bennett, Arthur M. (1974). Assessing the Performance of Rural Primary Health Care Systems. (NTIS No. PB-247 563; Contract No. HRA 106-74-182).**

This report describes a method that assesses the performance of a variety of manpower/technology combinations that provide rural primary health care. The method described is sensitive to the examination of the effects and capabilities of different manpower/technology combinations in terms of their contribution to primary health care system performance. The method features multiple performance measurements related to quality, accessibility, and cost of health care.

- 4. Bennett, A. M., W. H. Rappaport, and F. L. Skinner. (1978, July). A Study of the Technology Required To Support Non-Physicians Providing Health Care Services in Isolated Rural Areas. (NTIS No. PB-294 086; Contract No. HRA 106-74-182).**

*Note: Articles followed by an asterisk were written by staff of the Agency for Health Care Policy and Research (formerly the National Center for Health Services Research and Health Care Technology Assessment).

A comprehensive research program was conducted to identify, analyze, and plan innovative manpower and technology approaches--specifically telecommunications technology--toward improving health care delivery in isolated rural areas. This executive summary, developed in the form of an annotated bibliography, describes the individual projects supported under the program, the content of the publications produced, and the relationships between these projects and other developments in telehealth system applications.

5. Bennett, A. M., W. H. Rappaport, and F. L. Skinner. (1978, May). Telehealth Handbook: A Guide to Telecommunications Technology for Rural Health Care. DHEW Publication No. (PHS) 79-3210. (NTIS No. PB-292 557; Contract No. HRA 106-74-182).

With an emphasis on primary care, this handbook focuses on the application of specific types of telecommunications technology to the process of information exchange within a rural health care system. The intent of the handbook is to provide guidance to health care planners who want to consider the potential of telecommunications technology for improving the quality, accessibility, and efficiency of care.

6. Berk, Marc L., Amy B. Bernstein, and Amy K. Taylor. (1983, Winter). The use and availability of medical care in health manpower shortage areas. Inquiry 20(4), pp. 369-380.*

Data from the National Medical Care Expenditure Survey were used to examine access to care and utilization of health services in federally designated health manpower shortage areas. It was confirmed that residents of shortage areas--especially those in poor health living in rural areas--experience some deprivation in access to care and use of services. Factors such as income and health insurance coverage appear to be more closely associated with access and use than is an area's HMSA designation. The authors suggest the need to reexamine assumptions concerning access to care in federally designated shortage areas.

7. Bredesen, Norman B. (1970, April). The Granny Midwife: Her Training, Licensure, and Practice in Georgia, Louisiana, and Texas. (NTIS No. PB-271 852).*

The importance of trained and licensed midwives in providing obstetrical and immediate postnatal care to low-income black and Hispanic women in isolated rural communities in three States is explored. Data presented were obtained from national statistics and interviews with local health workers, low-income mothers, and midwives in Georgia, Louisiana, and Texas.

8. Burke, Richard T. (1972, July). A Review of the Experience of Two Small HMOs. (NTIS No. PB-250 812; Grant No. HS00471).

This report examines the feasibility of successful operation of health maintenance organizations in rural areas. Two rural-based HMOs are compared in terms of ownership, management, services

provided, benefit packages, enrollment, utilization, and finances. Operational difficulties are also discussed.

9. Castillo-Salgado, C. (1988). Unmet health care needs of Mexican-American children. [Unpublished final report]. (Grant No. HS05565).

The study used data generated by the Hispanic Health and Nutrition Examination Survey to assess the effects of selected socioeconomic, demographic, and cultural factors on utilization rates. Four chronic diseases, six health status indicators, four utilization indicators, and eight indicators of utilization relative to need were used to evaluate health care needs. The extent of unmet health care needs was identified (unmet needs were defined as the presence of illness conditions or impairments for which appropriate care had not been received). Preventive health care needs were defined as unmet if the child had not met American Academy of Pediatrics standards for preventive health care.

10. Castle, Charles H. (1977, June). Physician-MEDEX Radio Communication Link to Support Rural Health Care Delivery. (NTIS No. PB-281 800; Grant No. HS01481).

The basic research design applied in this investigation was an A-B time-series format by which baseline data generated from phase I of the study (baseline) were compared with data from phase III (systems-trial phase). Data on practice patterns indicated that statistically significant ($p < .05$) decreases occurred in the number of patient referrals from the MEDEX to the physician in phase II. Differences in patient volume, patient demographics, and diagnoses were also noted. The duration of MEDEX-physician communication also increased significantly during phase III ($p < .005$). In phase III, increased satisfaction with and confidence in the health care delivered by the MEDEX was noted for both patients and health care providers, and the MEDEX expressed greater satisfaction with their role. The study suggested that the use of two-way radios in the supervision of remotely deployed new health practitioners was both feasible and desirable in terms of patient care and patient-provider satisfaction.

11. Choate, Philip R. (1974, April). EMS (Emergency Medical Services) Research Proposal. (NTIS No. PB-249 290; Contract No. HSM 110-71-229).

This report describes the development of an emergency medical services system in western Arkansas. Included in the description are the system's objectives and methodology, budget and manpower data, and a time table for its regional implementation.

12. Christianson, Jon B. (1989, February). Alternative delivery systems in rural areas. [In: A rural health services research agenda]. Health Services Research 23 (6; special issue), pp. 849-889. (Grant No. HS05785).

This article summarizes research on alternative delivery systems in rural areas and, based on this review, suggests an agenda for future research. Alternative delivery systems, such as HMOs, PPOs, and primary care case-management programs, have a long history in rural America despite significant impediments to their development. However, little is known about the effect of these systems on rural communities and their medical care delivery systems. Existing qualitative studies, which have focused on rural HMOs, generally have been directed at identifying factors that facilitate or retard HMO development. Despite their limitations, these studies have addressed the need for quantitative analysis in a number of research areas: (1) the effect of rural alternative delivery systems on the cost and quality of care received by rural residents, (2) the effectiveness of different mechanisms used by these systems to contain costs, (3) the effect of alternative delivery systems on rural providers, (4) the extent to which the presence or absence of alternative delivery systems influences physician decisions to locate in rural areas, (5) the factors that are important in consumer decisions to enroll or not enroll in a rural alternative delivery system, and (6) the diffusion patterns of these systems in rural areas.

13. Christianson, Jon B., and Lee Faulkner. (1981, Spring). The contribution of rural hospitals to local economies. Inquiry 18 (1), pp. 46-60. (Grant No. HS03374).

The authors report results from a study of rural hospitals in eight western States which showed that the total community income stimulated directly and indirectly by hospital spending averaged around \$700,000 and could reach as high as \$1 million annually depending on the analysis unit used. Average annual salary income generated by rural hospitals in the study sample was about \$600,000. Generally, hospitals contribute more in salaries to rural communities than many other sectors of rural economies. These findings were significant in light of the wide range of problems plaguing rural hospitals and forcing the closure of many. The relative importance of hospitals to rural economies is one factor largely overlooked by policymakers that should be considered in deciding the fate of financially ailing facilities in rural areas. Despite the shaky financial condition of many rural hospitals, their operation resulted in substantial economic contributions to the incomes of the communities they served. (A more lengthy version of this paper is available under the title "Economic Issues in Reduction of Rural Hospital Capacity: A Research Summary," NTIS No. PB 81-206153.)

14. Cordes, Sam M. (1989, February). The changing rural environment and the relationship between health services and rural development. [In: A rural health services research agenda]. Health Services Research 23 (6; special issue), pp. 757-784. (Grant No. HS05785).

This conference background article focuses on the relationship between the larger rural environment and the delivery of health services in rural areas. The article defines "rural" and gives

limitations of these definitions, describes basic characteristics of rural America, provides a framework for rural development and the role of health services within this framework, and summarizes the salient features of today's rural America and how they relate to the challenge faced by researchers and policymakers.

15. Coreil, Marie Jeannine. (1979). Disease Prognosis and Resource Allocation in a Haitian Mountain Community. (NTIS No. PB81-215824; Grant No. HS02913).

This study analyzed strategies for family adaptation to child illness in rural Haiti by examining various cultural, social, and economic factors that influence how much time, effort, and money are spent on the treatment of specific early childhood diseases. In this population, perinatal disease and deaths were extremely high, with reportedly 40 percent of all deaths occurring among children under age 5. Data were collected (employing household survey techniques) on perceived probability of recovery, family structure, etiology of disease, resources allocated to treat disease, types of treatment sought, and beliefs about the causes of disease (that is, natural or supernatural). The findings support the general theoretical position that biological, sociocultural, and environmental factors interact as a system with regard to the human problem of disease.

16. Coward, Raymond T., and Stephen J. Cutler. (1989, February). Informal and formal health care systems for the rural elderly. [In: A rural health services research agenda]. Health Services Research 23 (6; special issue), pp. 785-806. (Grant No. HS05785).

For many small towns and rural communities, the "graying" of America is both real and unmistakable. Approximately one out of every four elders in the United States lives in rural America. Although there is considerable uncertainty about the degree to which differences in mortality and morbidity rates between rural and urban elders can be attributed to the effects of residence, in the area of health services there is more certainty that significant differences do exist and that they vary in direct relationship to geographic location. In this article the discussion about the rural elderly is divided into informal helping networks and formal networks of community-based services and residential care. The current state of knowledge and further needed research are described in each section. The author concludes that future rural health services research on the elderly should focus on understanding the location and distribution of the elderly in rural America; the life conditions affecting the health of the rural elderly; the development, delivery, and impact of health services on the elderly; and the methodological and theoretical difficulties of studying health and health care of the rural elderly.

17. Davis, Elizabeth. (1979). Installation of a Computerized Decision Support System in a Nurse Practitioner-Staffed Rural Health Clinic. (NTIS No. PB82-136094; Contract No. HRA 230-77-0112).

The feasibility of a link between the computerized Problem Oriented Medical Information System, PROMIS, at the University of Vermont in Burlington and a rural health clinic in Grand Isle, in Lake Champlain, was explored. A microwave system was installed linking the University of Vermont with terminals at Grand Isle. The response rate was much faster by microwave than by telephone. Initial data were collected on the practice setting using the manual PROMIS. However, due to staff turnover in the interim, the before-after effect was changed to a case study approach. Adaptations of the PROMIS guidance frames were found to be very time consuming as was their utilization by the nurse practitioner. There was resistance from most of the staff to using the system. The conclusion was that the system has potential but requires more time to implement.

18. DeFrieze, Gordon H., and Thomas C. Ricketts. (1989, February). Primary health care in rural areas: An agenda for research. [In: A rural health services research agenda]. Health Services Research 23 (6; special issue), pp. 931-974. (Grant No. HS05785).

In this conference background article, primary care was considered to include those basic health care services used most of the time in personal illness, chronic disease management, or health maintenance. Emergency health care and preventive health services, such as periodic conditions that do not require surgery or extensive high technology, and diagnostic evaluation were included. It is significant that many of the best-known efforts to restructure the systems of rural health care in rural America predated general use of the term "primary care" in medical organization literature. This article provides a brief review of the legislation and operational initiatives that were undertaken in rural areas in the 1960s to provide a framework for appreciation of the research agenda which was proposed. The paper contains sections on the supply and distribution of primary care providers, the organizational models for the provision of primary care in rural communities, the evaluation of the National Health Service Corps, the organization and ideology of rural primary care, and community-oriented primary care. The authors present an agenda for research on rural primary care, with both short- and long-term goals.

19. Dettman, Prentiss. (1976, June). Evaluation of Remote Radiographic Communication. (NTIS No. PB-259 622; Grant No. HS01210).

A commercially available slow-scan television system for transmitting radiographs between the small rural community of Broken Bow, Nebraska, and the Department of Radiology at the University of Nebraska was implemented and evaluated. Multiple images were stored on video disc before being read by the radiologist. This paper reports findings from this project in terms of utilization and equipment effectiveness and reliability.

20. Durmaskin, B. T., R. C. Althouse, W. Wyant, and E. Bosanac. (1982, July). Impact and Consequences of Changes in Health Care Coverage Provided by the United Mine Workers of America Health and Retirement Funds in West Virginia Primary Care and Multi-Specialty Clinics Having Extensive Miner Caseloads. (NTIS No. PB84-100239; Grant No. HS04317).

This report examines how changes in the health benefits provided by the United Mine Workers of America health plan affected utilization and delivery of services in 14 clinics in West Virginia that serve coal miners and their families. Findings showed that, although the clinics experienced a steady decline in physician staff, the scope and mix of services were essentially maintained. Further analysis showed that programs sponsored under the rural health initiative continued to provide support for a broad range of comprehensive health care services and also experienced a lower rate of attrition of both physicians and patients compared with the that of other clinics.

21. Eberle, Betty J., Lois Gonzales, and Edward A. Mortimer. (1973, February). A New Manpower Model of Rural-Urban Linkage for Improved Health Services. (NTIS No. PB-259 939; Contract No. HSM 110-69-241).

The authors present a detailed report on the development of an experimental primary care system in a low-income rural area of New Mexico in which there was no practicing physician. The system is evaluated in terms of community attitudes, service utilization, quality of care, and financial status. An appendix provides information on the community survey instruments employed. (The authors' summary of the project findings, under same title, is separately available as NTIS No. PB-247 513.)

22. Eisenberg, John M. (1981, March). Use of diagnostic services by physicians in community practice. Medical Care 19(3), pp. 297-309. (Grant No. HS02577).

This study analyzed the use of diagnostic studies by community physicians. Data from billing claims for outpatient visits by Medicaid recipients in three northeastern Pennsylvania counties during a 38-month period were studied, including 55,420 visits of 336 physicians. The physicians were described as practicing in urban areas (population >100,000), rural areas (population <10,000), or intermediate areas. Other physician characteristics examined included specialty, years since graduation, age, graduation from private or public school, M.D. degree or D.O. degree, foreign or domestic graduate, board certification, and prestige of medical school. The use of outpatient laboratory tests and of roentgenograms was correlated with the personal characteristics of the prescribing physicians. When casemix was controlled, analysis by specialty showed that internists ordered approximately the same number of procedures as family physicians, and both groups ordered more procedures than general practitioners. Other variables, including size and

location of practice and osteopathic or medical training, were not significantly related to patterns of use.

23. Elwood, Paul M., Jr. (1970, March). The Basic Features of a Quality Regulatory System. (NTIS No. PB-259 724; Grant No. HS00471).

This report presents various alternatives for controlling health care cost, quality, physician location, and physician specialty, especially in fee-for-service practices. Measures designed to affect urban-rural distribution of physicians are among the issues discussed.

24. Ermann, Danny A. (1990, Spring). Rural health care: The future of the hospital. Medical Care Review. 47(1), pp. 33-73.*

This paper examines the rural health care delivery system and Federal, State, and private programs which have affected the way in which care was provided. Although the focus is the rural hospital, other components of the delivery system are discussed so that the hospital could be assessed as a part of the total system. The following questions are addressed: What definition of rural is most useful in analysis of the health delivery system? How has the rural health care system evolved and what is the current configuration of resources? What characteristics of rural hospitals should be considered when studying the future of these facilities? What diversification or competitive strategies are available to rural hospitals which will allow them to remain viable institutions?

25. Farley, Dean E. (1985, March). Sole community hospitals: Are they different? A statistical analysis of the hospitals and their treatment under TEFRA and PPS (DHHS Publication No. (PHS) 85-3348). Hospital Studies Program Research Note 5, National Center for Health Services Research and Health Care Technology Assessment. Rockville, MD: Public Health Service.*

This Research Note presents information on sole community hospitals, nearly all of which are located in rural areas, and examines the extent to which they appear to warrant special consideration for Medicare reimbursement. Patterns of sole community hospital designation are also analyzed. The author points out that problems of sole community hospitals may be similar to those of other small rural institutions.

26. Farley, Dean E. (1982). Study of Investment Behavior in Community Hospitals. (NTIS No. PB83-205666; Grant No. HS03674).*

This study investigated the determinants of investment behavior in U.S. community hospitals. Hospital data of Pennsylvania (Cooperative Health Statistics System Hospital Survey, Medicare Cost Reports, and the AG-12 reports filed by the hospitals with the State Comptroller's office) were utilized. The results indicated that hospitals compete with rival hospitals for physicians and that capital stock decisions (diagnostic and

therapeutic services) were dependent on rival hospitals' actions. The analysis verified that physicians play a key role in areas over which they do not exercise direct control. The research concluded that to reduce expenditures, a strategy must be found to "foster competition among providers on the basis of total costs per incidence of morbidity." Hospital administrators must accommodate doctors' interests since doctors control major resources--professional services and patients.

27. Fifer, William R. (1976, March). Innovative Technology in a Rural Health Care System: Volume 1. (NTIS No. PB-264 912; Grant No. HS01591).

One thousand and twenty-six patients were followed through an episode of care in a rural ambulatory health care system. Tracks were developed for each patient through data collection from the medical record and an outcome interview. Patient tracks were screened for communication blocks of potentially harmful consequences to the outcome of patient care. The significant blocks were transposed into a problem list. Solutions to the problems were developed and put into both specific and general practice rules with accompanying methodology for their implementation. (Innovative Technology in a Rural Health Care System: Volume 2. Application to an Urban Setting is separately available under NTIS No. PB- 264 913.)

28. Finch, Larry E., and Jon B. Christianson. (1981, September-October). Rural hospital costs: An analysis with policy implications. Public Health Reports 96(5), pp. 423-433 (Grant No. HS03374).

Rising costs of health care, particularly hospital care, have focused legislative attention on the health care delivery system in the United States. One result of this attention was the passage of the National Health Planning and Resources Development Act of 1974, which gave public agencies at the State and local levels responsibility for health care planning. In connection with the act, national guidelines for health planning were issued in August 1977. Among other recommendations, the guidelines suggested that a maximum of four hospital beds per 1,000 people and a minimum occupancy rate of 80 percent for those beds were desirable for an efficient local hospital system. The desirability of applying the guidelines in rural areas depended on the magnitude of the potential cost savings from the resulting more intensive use of hospital capacity and from exploitation of economies of size. The purpose of this study was to supply information on hospital costs that could be used in making decisions relating to the delivery of health care to rural populations.

29. Greene, Sandra B. (1977). Medical Care Utilization Patterns in a Rural Area: A Study of Shopping Behavior. (NTIS No. PB-270 245; Grant No. HS02320).

The author presents data on medical care shopping--the use of multiple sources of medical care rather than as directed by the usual source--by persons in a rural area and in an urban fringe area. Over two-thirds of the sample who reported use of services were defined as shoppers; nonshoppers were found to have characteristics similar to those who did not use medical services. Potential insurance policy implications of the findings are also discussed.

30. Grundy, Betty L., Anne Medsger, Myrna Silverman, Edmund Ricci, Charles Bottoms, Margaret J. Gunter, and Catherine Callahan. (1987, December). Characteristics of nurse anesthetists working with and without anesthesiologists. Medical Care 25(12), pp. 1129-1138. (Grant No. HS04105).

All professionally active certified registered nurse anesthetists in four geographically representative States were surveyed by mail and telephone in 1981, and a response rate of ≥ 70 percent was obtained for each State. CRNAs who worked with anesthesiologists (group 1) were compared with those who worked in hospitals with no anesthesiologists (group 2). More than 75 percent of both groups were employed by hospitals, but group 2 CRNAs (15.5 percent of respondents) were nearly five times as likely to practice on an independent, fee-for-service basis. Members of group 2 worked predominantly in hospitals in small or rural communities and, when compared with those in group 1, were more likely to be male and older, less likely to hold a baccalaureate degree, and less likely to use invasive monitoring techniques. Nearly 50 percent of group 2 had no standing consulting relationship with an anesthesiologist. A consultation network supported by telecommunications deserves consideration as a means of providing CRNAs who work independently in small rural hospitals with a cost-effective team approach to anesthesia care. (The executive summary of this grant is separately available as Telehealth in Anesthesia: Model for a Network, NTIS No. PB84-221571.)

31. Hersh, Alice S., and Robert T. Van Hook. (1989, February). A research agenda for rural health services: Summary. [In: A rural health services research agenda]. Health Services Research 23 (6; special issue), pp. 1053-1064. (Grant No. HS05785)

This paper summarizes the six cross-cutting themes examined by a 1989 conference on rural health services research (see next annotation). These themes are (1) the need for complementary definitions of rurality; (2) the need for additional secondary analysis of existing data bases and the compilation of them into small area units; (3) problems related to recruitment, retention, and training of health manpower for rural areas; (4) the impact of problems related to professional liability on the rural health care system; (5) problems of transportation in rural areas; and (6) the need for a rural perspective in discussions and recommendations regarding health care quality. An agenda of 22 recommendations developed by the conference to address current

and projected needs related to rural health services research is included.

32. Hersh, Alice and Robert T. Van Hook. (1989, February). A rural health services research agenda: Preface. [In: A rural health services research agenda]. Health Services Research 23 (6; special issue), pp. ix-xi. (Grant No. HS05785).

In December 1987, the National Rural Health Association and the Foundation for Health Services Research sponsored a national invitational conference in San Diego, California, to develop a health services research agenda. The objectives of the conference were to summarize the existing research on key issues facing rural Americans, to identify gaps in the knowledge base of rural health services issues, and to develop a rural health services research agenda which could provide guidance to Federal policymakers. It was organized around six issues: 1) rural hospitals; 2) primary and emergency care in rural areas; 3) alternate delivery systems in rural areas; 4) the rural poor and uninsured; 5) maternal, adolescent, and child health in rural areas; 6) and the rural elderly and the long-term care continuum. A special 1989 issue of Health Services Research addressed these topics in a series of papers on the changing rural environment and the relationship between health services and rural development. The issue also contains background data on demographic characteristics, health status, and health services utilization. (Ten additional articles are contained in this special issue and they are listed elsewhere in this bibliography by author's name.)

33. Hogan, Christopher. (1988, July). Patterns of travel for rural individuals in New York State: Relationships between distance, destination, and case mix. The Journal of Rural Health 4(2), pp. 29-41.*

This article reports on a study of the travel patterns of individuals living in rural areas of New York State who were discharged from short-term general hospitals in New York State in 1983. Hospitals serving the rural population of New York were classified into three types: urban, consisting of all hospitals located in Metropolitan Statistical Areas; rural referral centers; and other rural hospitals. Rural patients who were admitted to each of these three types of hospitals were characterized in terms of distance traveled, casemix, length of stay, and age. Distance traveled and the expected cost of care were strongly positively related for patients admitted to urban and rural referral center hospitals but were only weakly related for other rural hospitals. Using several measures of illness severity, rural patients in urban hospitals and rural referral center hospitals were more severely ill than rural patients in other rural hospitals after adjusting for DRG mix. Somewhat higher payments to urban hospitals and rural referral center hospitals in New York were justified based on the more severely ill patients whom they treated.

34. Hogan, Christopher. (1988, April). Urban and rural hospital costs: 1981-85. (DHHS Publication No. (PHS) 88-3419). Hospital Studies Program Research Note 12, National Center for Health Services Research and Health Care Technology Assessment. Rockville, MD: Public Health Service.*

In the first section of this paper, rural and urban hospitals are contrasted along such structural dimensions as location, size, scope of services, and physician staff mix. Then various operating and cost characteristics of rural and urban hospitals over the period 1981-85, both inpatient and outpatient, are examined. Despite the many structural differences between rural and urban hospitals, the urban/rural difference in average cost per discharge and in all-payer revenues remained quite constant over this period. However, Medicare revenue per discharge grew much faster in urban hospitals. The final section of the paper discusses implications of these findings for Medicare reimbursement.

35. Hopper, Cornelius L. (1980). Rural Primary Emergency Care Systems Dynamics: A Study. (NTIS No. PB82-138561; Grant No. HS02293).

The principal site of this dissertation study was a 70-bed general hospital operated by Tuskegee Institute in a rural Alabama community of 12,000. The study's service population, predominantly black and disadvantaged, was comprised of 50,000 persons residing in three rural Alabama counties. By exploring the nature and quality of existing emergency room information, the research design was prospectively addressed to consider the utilization experience of the emergency room as compared with the utilization of the primary health care system. Additional determinations were made regarding the reasons for any changes from the client's perspective. The study showed that the earlier the intervention, the greater would be the effectiveness. In addition the demand for emergency care and rehabilitation services would be decreased.

36. Isaacs, Gertrude. (1977, May). PRIMEX-Family Nurse Training Program in Rural Areas. (NTIS No. PB-267 484; Grant No. HS00885).

Family nurse practitioners were prepared to provide primary health care as a means of increasing health manpower productivity and improving health services in a rural area. The model consisted of (1) a network of local services which identified and managed common daily health problems, provided primary health care, and provided access for entry to secondary care; and (2) a broad network of consultant and secondary health services which were readily available for the more complex problems requiring specialty care. This paper reports on how this innovation affected measures of costs, quality, access, and productivity in conjunction with PRIMEX projects.

37. Kane, Robert, Marilyn Dean, and Marian Solomon. (1979, May). An evaluation of rural health care research. Evaluation Quarterly 3(2), pp. 139-189. (Contract No. 230-77-1102).

This article reviews rural health research and evaluation with particular emphasis on the questions of access, health personnel, and financing. Major findings suggested that, although rural populations have somewhat less access to care than do urban populations, the ability to quantify precisely the extent and importance of this discrepancy was underdeveloped. Despite a substantial investment in a variety of rural health care programs, there was inadequate information as to their effectiveness. Programs designed to increase the supply of health personnel to rural areas have met with mixed success. Sites staffed by National Health Service Corps personnel showed consistently lower productivity than sites under other sponsorship. Nonphysician personnel (physician assistants and nurse practitioners) offered a promising source of primary care for rural areas; legislation that reimburses such care should increase their utilization. A persistent problem was the expectation (often a mandate) incorporated into many rural health care demonstration efforts that the programs become financially self-sufficient in a definite period of time. In many instances stringent enforcement of the self-sufficiency requirement may have meant that those who need the services most would be least likely to receive them.

38. Kane, Robert, Donna Olsen, Diana Wright, Josephine Kasteller, and J. Swoboda. (1978, October). Changes in utilization patterns in a National Health Service Corps community. Medical Care 16(10), pp. 828-836. (Grant No. HS02533).

The authors analyze utilization patterns in two adjacent rural Utah counties over a span of 5 years (1971-76). In one, a three-physician National Health Service Corps site was established during the interval; the other went from one family physician to two during the same period. The Corps site showed an increase in physician utilization while the "control" county utilization remained unchanged. However, despite the increased utilization of physicians in the Corps site, fewer respondents identified a family physician, especially one located within the county. This is consistent with an interpretation that county residents were content to use Corps physicians but saw them as transitory figures with whom they could form no permanent attachment. A second brief followup study a year later suggests that the community had already begun to acknowledge the Corps doctors as their family physicians.

39. Kane, Robert, Diana Wright, and Donna Olsen. (1978, June 12). Vector analysis of changes in medical care utilization in two rural communities. Social Science and Medicine 12, pp. 117-120. (Grant No. HS02533).

Vector representation of utilization for medical and consumer services was used to compare changes over time in two adjacent

rural counties. In one, a National Health Service Corps site was established; the other served as a control. The authors report that consumer utilization patterns remained stable over the 5-year study period. In the NHSC county, the shift in medical and hospital care was in the same direction as that for consumer goods, suggestive of a common response to changing trade patterns. In the control county, the medical and hospital care shift was in the opposite direction to the shift for consumer goods. Vectors provided a method for contrasting changes in one attribute with those in another within the same population and among different populations.

40. Kay, Bonnie J., and Justin A. Myrick. (1982, Winter). An evaluation of program implementation strategies for a rural first-responder system. Journal of Community Health 8(2), pp. 57-68. (Grant No. HS02507).

An experimental emergency first-responder system was introduced in 36 small Georgia communities as a means for addressing inadequate access to emergency medical services for these communities. Key to the program were community-selected residents who served as emergency medical coordinators, acting as first responders for information sources on emergency care and as system organizers. The evaluation reported here examined the process of organizing the program through local government versus voluntary group sponsors in terms of response and participation by communities and their ability to select effective EMCs. It assessed the effectiveness of a set of criteria for selecting residents as EMCs against performance measures which encompassed first-responder skills, activities which maintained public awareness, program awareness, and program visibility. Critical to program success was the degree of sponsor involvement in selecting EMCs.

41. Kelly, Joyce V., and John J. O'Brien. (1983, June). Characteristics of financially distressed hospitals. (DHHS Publication No. 83-3352). Hospital Cost and Utilization Project Research Note 3, National Center for Health Services Research and Health Care Technology Assessment.*

This report identifies and clarifies the roles of hospital casemix, operating characteristics, and other factors that may contribute to financial distress and discusses the effects of chronic deficits on hospital management and operations. Chronic financial distress is defined and analyzed across hospital urban-rural location. Differences in patient casemix and treatment patterns are examined to test hypotheses regarding causes of chronic deficits. Cost and revenue factors associated with differences in hospital output and operating characteristics are contrasted and policy implications are discussed. Findings show that financial distress is higher in rural hospitals than in urban hospitals.

42. Konrad, T. R., C. Seipp, E. Boyd, and J. Paul. (1984, January). Eight Coalfield Clinics: Their Development and

Responses to the Cutbacks in the UMWA (United Mineworkers of America) Funds Health Program. (NTIS No. PB84-182270; Grant No. HS04313).

The effects of changes in UMWA health benefits on eight clinic systems in coalfield areas of Kentucky, Alabama, Virginia, and Pennsylvania are examined. The analysis focuses on the staffing levels, scope of services offered, utilization, and management contingency plans of the clinics for 1976-80. The scope of services at all sites generally was found to be constant over the period although all of the clinics experienced a decline in utilization of services by miners and their dependents as well as a decrease in nonminer encounters.

43. Kviz, Frederick J. (1984, April). Attitudes toward physician advertising among rural consumers. Medical Care 22(4), pp. 300-309. (Grant No. HS02778).

The issue of whether physicians should advertise their services has been the subject of much debate among health policymakers. This study reports data from a survey of rural residents in Illinois regarding attitudes toward physician advertising and reasons for opposition or support of the practice. The results indicate neither strong opposition nor strong support for physician advertising. While those who are opposed are largely nonspecific regarding their reasons, those in favor primarily expect that it will aid in the selection of a physician. However, few respondents indicate a predisposition to shop for a physician. Although the major concern about physician advertising is a danger of false advertising by some physicians, it appears that the respondents are not trusting of advertising in general rather than of advertising by physicians in particular. These findings suggest that regardless of its potential advantages, physician advertising may be relatively ineffective because consumers may be inattentive, unresponsive, or distrusting.

44. Kviz, Frederick J., and Jacqueline Flaskerud. (1980, December). An Evaluation of the Index of Medical Underservice; Results from a Consumer Survey. (NTIS No. PB81-244345; Grant No. HS02778).

This study evaluated the validity of the Index of Medical Underservice by examining the ability of the index to discriminate levels of underservice as defined by consumers' assessments of health services in their area. This research was based on the premise that one of the most important tests of the index is whether differences in index scores for various areas actually reflect the real experience with health care of the people that live there. Data were collected from a total of 2,564 persons who completed mailed questionnaires (57.3 percent response rate) and from personal interviews during the spring and summer of 1978 from a stratified probability sample of households in rural counties in DHHS Region 5. The researchers reported that although statistically significant differences in the

expected directions were observed across IMU values for 15 of 17 survey measures in the analysis, the index is a weak discriminator, explaining only 17 percent of the variance in the survey measures as a whole. They concluded that their findings did not support the validity of the IMU as an indicator of the relative scarcity of health services and questioned its utility to determine funding priorities for health programs. The study was a useful contribution to the continuing debate over use of the IMU for planning and allocation of Federal health resources.

45. Lemrow, Nancy, David Adams, Rosanna Coffey, and Dean Farley. (1990, September). The 50 most frequent diagnosis-related groups (DRGs), diagnoses, and procedures: Statistics by hospital size and location. (DHHS Publication No. (PHS) 90-3465). Hospital Studies Program Research Note 13, Agency for Health Care Policy and Research. Rockville, MD: Public Health Service.*

This report provides national statistics that describe hospital discharges in the 50 most frequent classes of diagnosis-related groups, principal diagnoses, and principal procedures in 1986. The statistics for that year are based on all 1986 discharges from approximately 60 percent of all hospitals participating in HCUP-2, the second wave of the Hospital Cost and Utilization Project data base, which covers the period from 1980 to 1987. This 60-percent sample provides a national overview for the entire hospital sector and for four separate classes defined on the basis of hospital size (number of beds) and location as small rural, large rural, small urban, or large urban hospitals.

46. Leslie, Gary, and Edward Perrine. (1976, September). Experimental Health Services Delivery Systems: Northeastern Kentucky. (Volume 1: Final Report Attachments A-J, NTIS No. PB-260 980; Volume 2: Final Report Attachments K-N, NTIS No. PB-260 981; Volume 3: Final Report Attachments O-X, NTIS No. PB-260 982; Volume 4: Executive Summary, NTIS No. PB-260 983; Contract No. HSM 110-72-301).

An executive summary and several attachments report on the development of an experimental health services delivery system in rural northeastern Kentucky. Included are descriptions of the emergency medical services data and information system and the uniform hospital discharge data system, the household interview survey used for data collection, a guide to physician recruitment, and other health agency referral guides.

47. Little, Arthur D., Inc. (1976, February). EMCRO--An Evaluation of Experimental Medical Care Review Organizations: Evaluation of the Sells EMCRO. (NTIS No. PB-273 337; Contract No. HSM 110-73-526).

The report presents information on the Sells EMCRO service unit, which provides care to the Papago Indian Reservation and its adjacent small villages in southern Arizona. Contributions of the Sells unit to the medical care appraisal system are

discussed, including the incorporation of performance criteria for specific tasks, the development of system indicators to measure the patient's ability to work through the health care process, the refinement of an approach to outcome assessment using disease stages as markers for severity, and system applications to quality assessment and quality assurance.

48. Little, Arthur D., Inc. (1974, October). Evaluation of Maine EMCRO (Experimental Medical Care Review Organization). (NTIS No. PB85-107670; Contract No. HSM 110-73-526).

The early development of the national program on experimental medical care review organizations is illustrated through its application to the State of Maine from July 1972 through June 1973. Both organizational issues and medical care appraisal activities planned under the program are addressed.

49. Logan, Eddie W. (1976, June). Ecology of Migrant People--Mississippi. (NTIS No. PB-263 558; Grant No. HS00422).

Results are reported from a survey of a migrant, predominantly black community in rural Holmes County, Mississippi. Data were gathered on a number of epidemiological and other health-related factors: prevalence of hypertension, parasitoses, and streptococcal skin diseases; health services utilization; mortality; perinatal health status; use of health counselors; and other family characteristics.

50. Lucas, Fred, and Arthur J. Rikli. (1975, May-June). Automated physician's assistant. Clinical Engineering News 3(4), pp. 3-5. (Grant No. HS01571).

The authors briefly describe the development of a methodology for implementing an ambulatory care system design in several settings typical of rural practice. The development of a technique for both preevaluation and postevaluation of the effect of introducing change into a health care delivery system component is also discussed. Applicability of results of other physician's assistant developmental efforts to the system, as well as the potential development of an integrated software system of medical services using MUMPS, are also included.

51. Manard, Barbara B., and Lawrence S. Lewin. (1983, September). Physician Supply and Distribution: Issues and Options for State Policymakers. (NTIS No. PB85-124733; Contract No. 233-79-3018).

This report raises a series of analytic questions States must consider regarding physician manpower issues. Suggestions designed to help State and local policymakers decide on appropriate goals for physician manpower, based on a better understanding of the issues and of current physician supply, are presented and specific policy options and strategies to help States achieve their goals are discussed. Physician supply

implications for medically underserved rural areas are among those considered.

52. McManus, Margaret A., and Paul W. Newacheck. (1989, February). Rural maternal, child, and adolescent health. [In: A rural health services research agenda]. Health Services Research 23 (6; special issue), pp. 807-848. (Grant No. HS05785).

This article summarizes the most current national information on rural maternal, child, and adolescent health. It analyzes the health differentials among children in nonmetropolitan and metropolitan areas based on several national data bases of the National Center for Health Statistics. The principal data source used was the National Health Interview Survey. Three major problem areas are identified: (1) inadequate insurance coverage of children and pregnant women, (2) growing obstetric access crisis due to reimbursement and malpractice problems, and (3) deregionalization of perinatal networks. Most research on rural maternal, child, and adolescent health services research has been limited to 1970s data. This paper presents more recent statistics: 5 million nonmetropolitan children reside in poverty; poor nonmetropolitan children were reported to have 21 percent fewer physician contacts; they were 40 percent more likely to be hospitalized; and they spent 62 percent more days in the hospital. Medicaid eligibility restrictions for two-parent as well as working-poor families and for those with relatively high medical expenses had greatly limited the availability of Medicaid for the rural poor. In addition predominantly rural States failed to add optional eligibility groups even when Federal law permitted Medicaid expansions for pregnant women and infants up to 100 percent of the Federal poverty level without raising cash assistance levels. The report closes with specific research recommendations.

53. Mick, Stephen S., and Laura L. Morlock. (1990, October). America's rural hospitals: A selective review of 1980's research. The Journal of Rural Health 6(4), pp. 437-466. (Grant No. HS05998).

The authors review the literature on America's rural hospitals that was published during the 1980s within the context of the increasing restrictiveness in reimbursement and operating environments. Areas addressed include rural hospital definitions, organizational and financial performance, and strategic management activities. The authors also discuss research needs including development of more meaningful definitions of rural hospitals, methodological investigation of the effect of innovative programs and managerial strategies on hospital performance, and study of the effects of closure or conversion of rural hospitals on the health of the communities they serve.

54. Miles, David L. (1977, July). Health Team Effectiveness on Health Status in Lawrence County, Alabama. (NTIS No. PB-271 388; Grant No. HS01568).

Results are reported from a study that evaluated the effectiveness of health teams in Lawrence County, Alabama. Three measures of physical function were evaluated: Function Status Index, Index of Well-Being, and Sickness Impact Profile. Each scale was found to reliably and validly measure concepts of health-related dysfunctions. Rural area populations were less healthy (functionally). Dysfunctional families had lower incomes regardless of age, race, or residence. Physicians noted a financial impracticality in providing public health and special services on a fee-for-service basis. Physician assistants were economical when their services were supported by local hospital and mental health department funds. It cannot be assumed that increased access to primary care alone produces measurable improvements in rural health.

55. Miles, David L. (1977, Spring). Multiple prescriptions and drug appropriateness. Health Services Research 12(1), pp. 3-10. (Grant No. HS01568).

This article examines the relationship between number of prescriptions per office visit and the appropriateness of the prescribed drugs. Data were obtained on more than 20,000 prescriptions purchased for a low-income rural population during 1973 and 1974. Criteria for drug appropriateness were based on an AMA evaluation of drugs. The results showed that greater numbers of prescriptions per visit were associated with lower percentage of appropriate drugs prescribed and that patients whose prescriptions were written by specialists received a higher percentage of appropriate drugs than did those whose prescriptions were written by general practitioners. It is concluded, in support of other research studies, that a better knowledge of drugs leads to more conservative use of them.

56. Miller, Henry. (1978). Review and Analysis of State Legislation and Reimbursement Practices of Physician's Assistants and Nurse Practitioners. (Volume 1: Final Report, NTIS No. PB-279 243; Volume 2: Appendix, NTIS No. PB-279 244; Volume 3: Annotated Bibliography, NTIS No. PB-279 245; three-volume set, NTIS No. PB-279 242; Contract No. HRA 230-77-0011).

This report reviews and analyzes legislative and reimbursement regulations for the practices of nurse practitioners and physician's assistants. Final report findings include a detailed analysis of the status of PA and NP legislation in each State as well as State-by-State analysis of Medicaid reimbursement and a national analysis of reimbursement by Medicare, Blue Shield plans, and commercial insurance companies. A detailed State-by-State summary analysis of legislation and reimbursement practices is provided in the appendix, which also includes a list of individuals and organizations that could serve as State-level information sources.

57. Miners, Laurence A. (1981). The family's demand for health: Evidence from a rural community. Advances in Health Economics and Health Services Research 2, pp. 85-142. (Grant No. HS02417).

This article reports data collected by the Department of Community Health Sciences at Duke University which represent a population survey of 665 families living in a rural community north of Durham, North Carolina. Among other variables, information was collected on the health status and utilization of health care by each family member.

58. Miners, Laurence A., Sandra B. Greene, Eva J. Salber, and Richard M. Scheffler. (1978, Fall). Demand for medical care in a rural setting: Racial comparisons. Health Services Research 13(3), pp. 261-275. (Grant No. HS02417).

Household data from a southern rural community were used to examine racial differences in the utilization of medical care services, and both monetary and nonmonetary determinants of demand were considered. Results from regression analysis indicate that office waiting time (for black households) and travel time to the provider (for both black and white households) have a greater effect on demand than price. Racial differences exist in the effects of health insurance coverage and household income on household medical visit expenditures, and both need and household size were found to be consequential determinants of demand. (An earlier version of this paper is available under the title, "The Family's Demand for Health: A Rural Investigation," NTIS No. PB82-141011.)

59. MITRE Corp. (1975). Technology Required to Support Non-Physician Health Care in Rural Areas. (NTIS No. PB-252 275-SET, 7 volumes; Contract No. HRA 106-74-182).

This seven-volume set of reports (each of which is separately available) includes the following: three volumes of proceedings from workshops held in 1974-75 to coordinate research activities for assessing the performance of ambulatory care systems (NTIS Nos. PB-252 279, PB-252 280, and PB-252 281 for workshops 1, 2, and 3 respectively); a volume of proceedings from a 1975 workshop for rural physicians (NTIS No. PB-252 282); a report on a method for tracing patient paths in emergency medical service systems (NTIS No. PB-252 278); an investigation of health manpower resources for rural primary care delivery (NTIS No. PB-252 276); and an analysis of the potential impact of telecommunication-based technology on extending the capabilities of nonphysician providers in isolated rural areas (NTIS No. PB-252 277).

60. Moore, Patricia D. (1984). Utilization of Ambulatory Health Services by Hispanics. (NTIS No. PB85-243095; Grant No. HS05011).

The author uses data from the National Health Interview Survey to compare ambulatory services utilization by Hispanic groups, including Mexican-Americans, Cubans, and Puerto Ricans. National Health Interview Survey data were used to obtain the information for analysis. Puerto Ricans were significantly more likely to see a physician within the year than the comparison groups. Mexican-American adults had consistently lower levels of physician contact compared with the other groups, except for

adults over 65 years of age. Mexican-American children were much less likely than children of the other groups to see a physician within a year even when the need indicators of fair/poor health status were controlled. Cuban-Americans fared well in relation to access to care compared with the other subgroups (their distribution is very similar to the white population). Black non-Hispanics had important access differences by age. Black children, especially the "other low income" group, had lower access levels than all other groups except Mexican-Americans. There were consistently higher levels of ill health reported by Puerto Ricans on health status measures employed in this study compared with the other subgroups. Geographic differences between urban and rural groups were also determined.

61. Moscovice, Ira. S. (1989, February). Rural hospitals: A literature synthesis and health services research agenda. [In: A rural health services research agenda]. Health Services Research 23 (6; special issue), pp. 891-930. (Grant No. HS05785).

This background paper describes the struggle of rural hospitals to survive due to the dramatic changes taking place in rural America through a discussion of trends and a literature review of research on rural hospitals. The scope of services in rural hospitals described includes: obstetric and perinatal services, pediatric services, general medical services, surgical services, and emergency medical services. Problems in measuring quality of care as it relates to performance of rural hospitals are also discussed. The author concludes with a proposed agenda for health services research on rural hospitals.

62. Moscovice, Ira S., and Roger Rosenblatt. (1979, May). The viability of mid-level practitioners in isolated rural communities. American Journal of Public Health 69(5), pp. 503-505. (Grant No. HS01978).

The authors summarize the problem of access to the traditional health care delivery system in rural areas, especially remote areas, and report on one study that examined the attempt of the National Health Service Corps in the Pacific Northwest (Washington, Oregon, Idaho) and Alaska to train and use nonphysician health providers (physician assistants and nurse practitioners) to delivery primary care services to a geographically isolated community. The high expense ratio demonstrated by the sites reflected the fact that a modern curative medical practice required an expensive plant and relatively high personnel costs. Fixed costs were high; variable costs were relatively low. This was exemplified by the Alaskan sites in which extremely remote, small villages had low utilization, high need, and high operating costs. It was suggested that good management and experience might reduce these costs. Problems of equity, including the need to make curative health care readily available to remote populations were also addressed. One possible solution suggested was to increase external subsidies to increasingly smaller communities. On the other hand, the data suggested that from an economic standpoint

mid-level practitioner sites that are started and nurtured in communities of over 1,500 to 2,000 people can approach financial self-sufficiency.

63. Moscovice, Ira S., and Roger Rosenblatt. (1982, October). Viability of the Rural Hospital: A Synthesis of Findings from Health Services Research. (NTIS No. PB84-111442; Contract No. 233-79-3025).

Results are synthesized from a review of the health services research literature. The purpose of this synthesis was threefold: (1) to provide an objective review and critical analysis of what is known and what is not known from the existing body of research on the performance of rural hospitals; (2) to identify and examine the influence of the major external factors which affect viability; and (3) to outline potential options and strategies for strengthening the viability of these institutions.

64. Mudgett, Carol. (1983, May). Navajo Ambulatory Care Utilization Patterns. (NTIS No. PB83-248674; Grant No. HS04270).

The effects of accessibility and availability of ambulatory care services upon the utilization of these services and health status in a Navajo population are summarized. The western, more isolated part of the reservation was shown to have higher rates of visits than the eastern part for infective/parasitic, respiratory, and ear diseases. No general patterns of differences were found for visits for chronic diseases or visits relating to excessive drinking, motor vehicle accidents, or nutrition. The persistence of infectious diseases points to a continuing need for improvements in environmental conditions, such as adequate housing, water, sewage disposal, heating, and nutrition. The medical system was shown to be ill equipped to deal comprehensively with major causes of Navajo mortality and morbidity, excessive drinking, and motor vehicle accidents.

65. Myrick, Justin A., Bonnie J. Kay, Darlene Kishbaugh, Julian V. Pittman, and Nelson F. Sayford. (1983, April). Acceptance of a volunteer first-responder system in rural communities: A field experiment. Medical Care 21(4), pp. 389-399. (Grant No. HS02507).

This article describes a randomized-control field experiment that was used to evaluate the impact of an organized volunteer-based emergency first-responder system in 36 rural, medically underserved communities in central Georgia. The system created an information network within communities, which allowed rapid contact with trained resident volunteers when emergencies occurred. The evaluation examined selected environmental variables related to creating an information network and their effect on the general public's willingness to use a first-responder system for medical emergencies. Measurements of community awareness and attitudes were made using a household telephone survey conducted immediately before project initiation and 3 months and 13 months after implementation. Willingness to

use the system was greatest for individual respondents living in communities with fewer than 800 people who were participants in the social network of the community. Implications for the administration of this type of project through statewide EMS systems were discussed. (An earlier version of this paper is available under the title "Rural Volunteer Emergency Medical Coordinators," NTIS No. PB83-141242.)

66. National Rural Center. (1977, December). Nurse Practitioners/ Physician Assistants: A Research Agenda. (NTIS No. PB-288 908; Grant No. HS02829).

Conference proceedings are presented from a health manpower symposium held in June 1977. The report includes papers on five issues as they relate to nurse practitioners and physician assistants, particularly in remote rural areas: practice setting variations, reimbursement, cost containment, training, and interpersonal communication. (A summary of the conference is separately available as NTIS No. PB-294 084.)

67. Nations, M. K. (1982). Illness of the Child: The Cultural Context of Childhood Diarrhea in Northeast Brazil. (NTIS No. PB84-145440; Grant No. HS04437).

The author reports on how sociocultural and behavioral factors affect the management of infants and children with gastrointestinal infections in northeastern Brazil. Qualitative and quantitative methods used in the analysis were derived from medical anthropology, epidemiology, and microbiologic research techniques. The study population consisted of a random sample of 50 households, three neighborhoods of affluent professionals, migrant wage laborers, and poor farmers.

68. Neham, E., E. Anderson, T. Landau, W. McQuiggan, and D. Vickery. (1976, November). The Testing of an Evaluation Methodology for Emergency Medical Services Systems. (NTIS No. PB-291 224; Contract No. HRA 106-74-0182).

This Executive Summary gives a general approach--patient trajectory analysis--for analyzing and evaluating an ambulatory component and an emergency medical services component of primary medical care systems. The analytical approach is used differently in each of the two subsystems. In the ambulatory area, trajectories describe the alternative routes or pathways to various providers and facilities; in the emergency area, trajectories denote the time-related sequences in which various levels of clinical interventions become available to the patients using the system. The trajectory analysis methodology for the ambulatory area, in which the subsystem's performance was measured in terms of cost, access, and quality of care, was tested using data obtained from an ambulatory medical care delivery site in rural Maine.

69. Nichols, Andrew W. (1981, September). Border Health Focused Research Agenda Development Conference Proceedings. (NTIS No. PB83-186619; Grant No. HS04527).

Proceedings are compiled from a conference that brought together health policymakers (legislators and health commissioners) and policy researchers from the four U.S.-Mexico border States. Topics of importance, from both policy and research perspectives, were discussed. They included maternal and child health, long-term care for the elderly, the problem of changing levels and sources of funding of health care and policy research, and the changing nature of the border region, with emphasis on the problem of the undocumented immigrant. A product of these interactions was a border health focused research agenda which summarized research topics seen as important by conference participants.

70. Norton, Catherine H., and Margaret A. McManus. (1989, February). Background tables on demographic characteristics, health status, and health services utilization. [In: A rural health services research agenda]. Health Services Research 23 (6; special issue), pp. 725-756. (Grant No. HS05785).

Tables designed to be used as supplementary material for a rural health services research agenda conference are presented. They include data on demographic characteristics, health status, and health services utilization for the United States metropolitan and nonmetropolitan area populations.

71. O'Neill, John J., Joseph T. Nocerino, and Philip Walcoff. (1975). Benefits and Problems of Seven Exploratory Telemedicine Projects. (NTIS No. PB-247 840; Contract No. HRA 106-74-182).

This report discusses benefits and problems in using visual communications technology to improve health care delivery in isolated, sparsely populated agricultural areas. The experiences of seven telemedicine projects sponsored by the National Center for Health Services Research from 1972 to 1974 are summarized. Each of the projects covered by the report has a specific chapter. Each project chapter has an identical format which includes a summary of each project, a technological description, a discussion of the training and orientation programs, and a delineation of operating and organizational procedures. The authors examine benefits and difficulties of each project under the separate categories of legal, technical, financial, and operations.

72. Osborne, Francis, Edward Perrine, John Carter, and Cindy Peake. (1976, November). Experimental Health Services Delivery Systems: Northeastern Kentucky Ambulatory Care Survey for Eye Care Services as a Function of Provider and/or Payor. (NTIS No. PB-265 670; Contract No. HSM 110-72-301).

Results are reported from the eye care survey component of a larger ambulatory care study in rural northeastern Kentucky.

Data are included from a sample of provider-client encounters during a 2-week period in January 1975. Results show that nearly 90 percent of all eye care encounters during the period involved refraction or prescription, dispensing, or adjustment of corrective lenses.

73. Patton, Larry T. (1988). The Rural Health Care Challenge. Staff Report to the U.S. Senate, Special Committee on Aging (pp. 1-116). 100th Congress, 2d Session. Washington, DC: U.S. Govt. Print. Off.*

This report addresses Congressional concern with assuring access to health care in rural areas. In 1988 alone, the Special Committee on Aging held three hearings on the subject to help focus attention on the numerous problems of the rural health care system, as well as the various innovative strategies rural communities were attempting to access and retain needed health care providers. The Committee's intention in requesting this report was to promote a greater awareness of problems affecting the ability of rural communities to deliver needed health care services, as well as to provide recommendations for needed policy changes.

74. Patton, Larry T. (1988). The rural homeless. Homelessness, Health and Human Needs (pp. 183-217). Washington, DC: National Academy Press.*

The author examines the nature and causes of homelessness in rural areas. The structural transformation now underway in the rural economy, the nature of the rural environment, and rural social service networks are briefly reviewed, as well as the available evidence on characteristics of the rural homeless. The limited data on medical care utilization of the rural homeless are also examined. Primary sources of data used for the analysis include a study of the homeless in Ohio supported by the National Institute of Mental Health. The community health center survey requested by DHHS included all 10 regions but only Region 5 (Chicago) had data available at the time of this publication. Data were also secured by site visits.

75. Patton, Larry. (1989, February). Setting the rural health services research agenda: The Congressional perspective. [In: A rural health services research agenda]. Health Services Research 23 (6; special issue), pp. 1005-1051. (Grant No. HS05785).*

The growing legislative concern with rural health issues was reflected in the 1987 congressionally mandated conference, "A Rural Health Services Research Agenda," for which this article was prepared. Approximately 50 interviews were conducted in the spring and summer of 1987 with Congressional staff, the personnel of Congressional support agencies, and key staff of Federal independent commissions that have focused on rural health issues. Congressional staff members identified broadly based needs for rural health services research: the need to develop a typology for classifying rural areas, the need to document and evaluate

both the accomplishments of existing Federal rural health programs and how these programs can be improved, and the need to evaluate and disseminate information on successful rural health care models. This paper discusses these needs as they relate to the six themes of the conference: rural hospitals; primary care and emergency medical care systems; alternative delivery systems and managed care; the rural elderly and the continuum of long-term care; maternal, child, and adolescent health; and the rural poor and uninsured.

76. Perrine, Edward L. (1973, April). Health Utilization Survey for Northeastern Kentucky. (NTIS No. PB-259 732; Contract No. HSM 110-72-301).

The author reports results from a health care survey of 15 counties in rural northeastern Kentucky in 1973. The survey estimated the total volume of selected health services used and the discrepancy between need and use. The survey methodology and a discussion of the results are also included. (An earlier version of this report describing the sampling plan employed in the survey is available under the title, "Northeastern Kentucky Health Utilization Survey: Draft Paper," NTIS No. PB-259 731. Tabular cost data for this study and comparisons with national expenditures are available in "Health Services Funds Flow in Northeastern Kentucky 1971," NTIS No. PB-249 087.)

77. Perrine, Edward, John Carter, Cindy Peake, and Francis Osborne. (1976, December). Experimental Health Services Delivery Systems: Northeastern Kentucky Ambulatory Care Survey for Home Health Care. (NTIS No. PB-265 668; Contract No. HSM 110-72-301).

Results are reported from the home health survey component of a larger ambulatory care study in northeastern Kentucky. Data were collected over a 2-week period in January 1975 in a 15-county rural region of the State. Applications to long-term care and tertiary home care are also discussed.

78. Perry, Henry B., and Elinor L. Redmond. (1980, December). Deployment and Career Trends of Physician Assistants. (NTIS No. PB81-206542; Grant HS03014).

The authors report results from a number of survey and analytical activities undertaken to further understanding of the role of physician assistants in the health care delivery system. Included are an analysis of a 1978 national survey of 4,500 physician assistants, a comparison of these survey findings with those obtained from a similar 1974 survey, and an analysis of a cohort sample of physician assistants over the 1974-78 period. Part of the report compares the role of physician assistants with that of nurse practitioners in Maine and findings show that the latter were more likely to work in rural areas and see more patients per week.

79. Pope, Fergus. (1974, September). North Carolina Region D Health Maintenance Project. (NTIS No. PB-239 174); Grant No. HS01086).

Results are reported from a seven-county health maintenance project in rural northwestern North Carolina. The project was designed to develop linkages between family intake, child health, and mental health programs in order to improve access to health services, especially for individuals considered to be at high risk. The development of a coordinating health agency management system to oversee the regional health care delivery system is also discussed.

80. Puskin, Dena S., Emma K. Lee, Sueann Kachmaryk, and Susanne Segelman. (1982). Development and Use of Expenditure Data for HSAs (Health Systems Agencies). (NTIS No. PB83-172700; Grant No. HS03459).

The authors summarize the development and use of health expenditure profiles in a nine-county region (Finger Lakes Health Systems Agency area). Expenditure profiles served as the basis for the expansion and refinement of an existing methodology including coverage of additional providers and service, secondary flow analysis (transfer of funds among health care providers in a region), and the use of Medicare reimbursement data by county of patient residence. Data were collected to allow for data reorganization to meet a variety of needs. Applications of expenditure profile analysis were examined and documented in order to facilitate use by other planning agencies.

81. Quenk, Naomi, and Lois Benham. (1973, February). Procedures and Instruments for Evaluating Community Response to a New Health Manpower Model. (NTIS No. PB-248 701; Contract No. HSM 110-69-241).

The study protocol, methodology, and survey instruments used to evaluate an experimental medical care facility in a low-income rural community are described. The manpower model is based on the use of nonphysician providers to improve health services delivery and enhance access to care in Torrance County, New Mexico.

82. Ramey, J. Wendell, and Robert Pecarchik. (1972, August). An Approach to the Systematic Delivery of Human Services in a Non-Urban Community. (NTIS No. PB-259 765; Contract No. HSM 110-71-254).

An experimental program that attempts to integrate parallel health and welfare programs in the Mon Valley region of Pennsylvania into a single delivery system is examined. The report describes the establishment and goals of an umbrella service delivery agency as well as the operations of both its research component and its community development component.

83. Rockoff, Maxine L., and Arthur M. Bennett. (1978). The patient trajectory: A modeling tool for planning and evaluating rural telemedicine systems. In Evaluating New Telecommunications Services (pp. 79-106). New York, NY: Plenum.*

This paper discusses an analytical tool which was developed and applied for the use of telecommunications technology to link a nonphysician health care provider in a rural satellite clinic to a central source of medical expertise. The measurement tool compared the performance of different manpower/technology combinations. It was based on the concept of a "patient trajectory," the sequenced set of interactions that take place between a patient and the health care system from the time the patient perceives a need for medical care until that problem is resolved. For a fixed nonphysician manpower level (defined by medical protocols), three independent physicians estimated the ability of different telecommunications technologies to avert patient travel at decision points within the protocols that called for physician consultation or referral. These judgments were used as inputs to a computer simulation to assess prospectively the overall effects on reducing patient travel that might be expected from each of several telecommunications technologies. The major result obtained was that telephone-compatible narrowband technologies (such as slow-scan television) could avert nearly two-thirds of the travel projected with broadband technologies.

84. Rockoff, Maxine L., Louis Gorin, and Joel C. Kleinman. (1979, Spring). Positive programming: The use of data in a planning for the rural health initiative. Journal of Community Health 4(3, pp. 204-216.*

A data-driven approach to allocating Federal resources for primary care systems in rural areas is presented. This approach was developed and implemented by the Public Health Service when it undertook its rural health initiative program. Nationally available small-area data were used to identify "priority counties" and PHS regional office staff were asked to take an active role in developing rural health system projects in these counties. This paper defines and discusses the positive programming approach (believed to be the first attempt to allocate Federal health service delivery resources actively on the basis of small-area data), discusses its shortcomings (including data limitations), and presents the results of its implementation. In the first year, 23 percent of the priority counties and 13 percent of the nonpriority counties were served, while in the second year 39 percent of the priority counties and 17 percent of the nonpriority counties were served. The substantial increase in the percentage of priority counties served reflects the effectiveness of a positive programming effort.

85. Roland, Diane, and Barbara Lyons. (1989, February). Triple jeopardy: Rural, poor, and uninsured. [In: A rural health

services research agenda]. Health Services Research 23 (6; special issue), pp. 975-1004. (Grant No. HS05785).

This background paper reviews the existing literature on urban and rural differences for the uninsured population, presents new analyses to supplement earlier research, and identifies issues for future research. The extent of poverty in urban and rural areas and the scope of insurance coverage for the nonelderly population are discussed as issues in financing medical care. Health status and use of health services by the poor and uninsured in urban and rural areas are assessed and contrasted in terms of access to care. An agenda for future research is also proposed.

86. Romm, Joseph. (1980, February). Evaluation of Findings from Nurse Practitioner and Physician Assistant Studies. (NTIS No. PB81-196461; Contract No. 233-78-3015).

The author reports on an evaluation of eight national studies of nurse practitioners and physician assistants and another study on nurse midwives conducted over the 1974-78 period. Physician extender issues explored in the evaluation analysis include patient satisfaction with care, physician/employer acceptance, quality of care provided, reimbursement, training support, and demand for and utilization of physician extender services in medically underserved rural areas.

87. Rosenblatt, Roger. (1978). The growth and evolution of rural primary care practice. Medical Care 16(10), pp. 819-827. (Grant No. HS01978).

The economic growth and development of 12 rural primary care practices established by the National Health Service Corps in the Pacific Northwest between 1973 and 1975 is examined. The 12 practices represented four types of rural health care delivery systems based on the size of the service area, the presence and type of hospital within that service area, and the number and kinds of providers in the service area. The results presented indicate that rural primary care practices, in at least one region of the United States, can approach financial self-sufficiency in 2 to 3 years. However, practices grow at different rates, depending on the nature of their surrounding environment, and provider retention appears to be correlated with practice growth and stability. In the setting studied, practices in which physicians were the major providers and had ready access to hospital facilities grew relatively rapidly, approaching financial self-sufficiency within 2 to 2-1/2 years. Practices with physicians who did not have ready access to a hospital grew more slowly and had more erratic growth patterns than other types of practices. Practices staffed solely by nurse practitioners initially had slow growth but began to approach self-sufficiency after 3 years of operation.

88. Rosenblatt, Roger A., and Ira Moscovice. (1978, April). Establishing new rural family practices: Some lessons from a

federal experience. Journal of Family Practice 7(4) pp. 755-783. (Grant No. HS01978).

This article reports on the experience of the National Health Service Corps in Washington, Oregon, and Idaho in establishing 20 new rural family practices over a 6-year period. The practice structure, demography of the practice environment, and economic characteristics of the practices over time were analyzed in an attempt to isolate those factors which were associated with practice viability and physician retention. The outcome of each of the practices was examined in relation to the structure of the practice, training of the assigned physician, size of the town, and presence or absence of a group practice and supporting hospital. The results indicate that it was possible for a new rural family practice to achieve financial equilibrium after approximately 2 years of operation. Forty-two percent of the physicians assigned to these practices elected to stay beyond their initial commitments; 17 percent of the sample made the transition into private practice. Factors associated with success included the presence of a hospital, group practice, and residency training. Impediments to success included service area population size below 4,000, lack of a hospital or group practice, and practices which mixed older and younger physicians.

89. Roth, Irvin J., Ross Mullner, and Jack Goldberg. (1977, January). The Delivery of Rural Emergency Medical Services Systems: A Spatial Analysis. (NTIS No. PB-267 487; Grant No. HS01957).

Changes in rural automobile-related injuries and deaths associated with the initiation of an emergency medical services system are analyzed. Specifically, the authors investigated changes in the time from accident to treatment, the hospital utilized for treatment, and the type of injuries sustained in severe automobile accidents in a large rural area of southern Illinois. Unlike other evaluation attempts, characteristics of both those who died and those who were severely injured but survived were analyzed. These groups were compared before and after the initiation of the emergency medical services system. The factors that played a significant role in the declining fatality rates which occurred in the region were also identified.

90. Schwartz, Jerome L. (1969). Early Histories of Selected Neighborhood Health Centers. (NTIS No. PB-256 344; Grant No. HS00234).

This report traces the evolution of five neighborhood health centers, two of which are in rural areas (Mount Bayou, Mississippi, and King City, California), and discusses some of the innovations introduced by each center. Also described is the background and nature of the neighborhood health center movement.

91. Schwartz, William B., Joseph P. Newhouse, Bruce W. Bennett, and Albert P. Williams. (1980, October 30). The changing geographic distribution of board-certified physicians. The New

England Journal of Medicine 303(18), pp. 1032-1038. (Grant No. HS03808).

This article examines the distribution of board-certified specialists among cities and towns of different sizes. Between 1960 and 1977, the diplomates of the eight specialty boards who were practicing for the first time in many small nonmetropolitan towns were studied. The percentage increase in the number of specialists in small towns significantly exceeded that in cities, but the absolute increase in specialists per 100,000 persons was greater in metropolitan areas. The findings suggest that the increased supply of specialists activated market forces that caused the observed changes in distribution. It is also possible that a new preference for small-town living contributed to this evolving pattern. Furthermore if an increase in physician supply has been the major force responsible for the movement into nonmetropolitan areas, this trend might imply that smaller and smaller towns will acquire board-certified specialists if the overall number of physicians continues to increase.

92. Schwartz, William B., Joseph P. Newhouse, Bruce W. Bennett, and Albert P. Williams. (1983). Changing Geographic Distribution of Board-Certified Physicians: Facts, Theory, and Implications. (NTIS No. PB84-157577; Grant No. HS03808).

Data are presented on the location of board-certified specialists by town in 25 rural States for the period 1960-77 to determine factors that were associated with the presence of a specialist in a town and effects of changes in the location of specialists on the distance the rural population must travel to receive specialty care. Computerized data bases were utilized to identify characteristics associated with the migration of physicians from rural to urban areas over the 17-year period. Data such as the size and distribution of cities and towns larger than 2,500 population in each State and the location of urban population centers (cities over 25,000) utilizing census tracts were used to array physicians in population areas of both low and high density.

93. Seibert, Dean J., Harold F. Pyke, and Charlotte J. Sandborn. (1974, December). The Provision of Speech Therapy and Dermatology Consultations via Closed Circuit Television. (NTIS No. PB-238 603; Contract No. HSM 110-72-387).

The authors report on an 18-month study of the delivery of speech therapy services and dermatologic consultations to widely separated rural areas via two-way closed-circuit television. In addition to operational and technical concerns addressed by the study, social and psychological issues are also discussed.

94. Short, Pamela Farley, Alan Monheit, and Karen Beauregard. (1989, September). A profile of uninsured Americans. (DHHS Publication No. (PHS) 89-3443, NTIS No. PB90-101015). National Medical Expenditure Survey Research Findings 1, National Center

**for Health Services Research and Health Care Technology
Assessment. Rockville, MD: Public Health Service.***

This paper presents estimates of the size characteristics of the uninsured population from a new data source, the 1987 National Medical Expenditure Survey. Data from the first NMES interview indicate that 37 million persons were uninsured in early 1987. NMES confirmed and updated a number of well-known facts about this population. Lack of insurance was observed at the highest rate among young adults and among blacks and Hispanics, as well as persons in families where no one was employed. However, workers and their families still accounted for more than three-quarters of the uninsured. Employees of small firms, low-wage earners, part-time employees, and the self-employed, as well as employees in industries characterized by seasonal and temporary employment and by a less skilled and less unionized workforce, were most likely among the working population to lack insurance for themselves and their families. (An earlier version of this paper was presented at the 1988 annual meeting of the American Public Health Association, Boston, MA.)

95. Shortell, Stephen M., Ellen M. Morrison, Bernard S. Friedman, Susan L. Hughes, and Edward F. Hughes. (1987, December). A Study of the Strategy, Structure and Performance of Multi-Hospital Systems. (NTIS No. PB88-208335; Grant No. HS05159).

The authors summarize data from eight multi-institutional systems comprising 570 hospitals in 45 States. The systems varied by size, centralization of decisionmaking, location, and degree of geographical concentration. Member hospitals were analyzed to discern the relationships among environment, strategy, structure, and performance. (A more extensive treatment of this topic is found in Shortell, Morrison, and Friedman's 1989 report, Strategic Choices for America's Hospitals, San Francisco, CA: Jossey-Bass.)

96. Shortell, Stephen M., and Edward F. Hughes. (1988, April 28). The effects of regulation, competition, and ownership on mortality rates among hospital inpatients. The New England Journal of Medicine 318(17), pp. 1100-1107. (Grant No. HS05159.)

The authors examine the associations between higher mortality rates among inpatients and the stringency of State programs to review hospital rates, the stringency of certificate-of-need legislation, and the intensity of competition in the marketplace, as measured by enrollment in health maintenance organizations. Data for the analysis were collected in a large multi-institutional study of eight hospital systems that varied by a number of factors, including location and degree of geographical concentration.

97. Shortell, Stephen M., Ellen M. Morrison, Susan L. Hughes, Bernard S. Friedman, James Coverdill, and Lee Berg. (1986, Winter). The effects of hospital ownership on nontraditional services. Health Affairs, pp. 97-111. (Grant No. HS05159).

This article points out that hospitals, once the traditional base for medical care, have begun to offer a wider range of services in order to compete effectively with emerging health care delivery systems. (Further details on services diversification are available in a 1987 paper by Shortell and others, "Diversification of Health Care Services: The Effects of Ownership, Environment, and Strategy" in Advances in Health Economics and Health Services Research, vol. 7, pp. 3-40. Specific differences on type and level of diversification between rural and urban hospitals is found in Shortell's 1988 report, "The Characteristics and Performance of Rural Hospitals: Findings from the Multi-Hospital Systems Study," in New Alliances for Rural America, Washington, DC: National Governors' Association.)

98. Silver, George A. (1980, August). Priorities for Research in Maternal and Child Health Services: A Literature Review. (NTIS No. PB81-197162; Grant No. HS04145).

Health services research literature is reviewed and synthesized with emphasis on the health and medical services needs of mothers and children; the different utilization of such services by race, socioeconomic status, and geographic area; and manpower requirements for provision of the services. Studies were evaluated for scope, focus, and methodology so that issues raised in the literature, assessments of program effectiveness, and other aspects of the studies could be synthesized. The report includes a list of research topics reflecting both gaps in the literature and areas for followup research as well as an extensive bibliography of approximately 1,200 annotations and 300 additional reference citations.

99. Skelly, Owen. (1974, June). Indian Health Services in Western South Dakota. (NTIS No. PB-255 838; Contract No. HSM 110-72-379).

The author describes the organization and delivery of health care services to the American Indian population in western South Dakota through programs administered by the U. S. Indian Health Service. Selected mortality and morbidity data are included.

100. Slesinger, Doris P. (1982, March). Migrant Agricultural Workers in Wisconsin. (NTIS No. PB83-192476; Grant No. HS04368).

Results are reported from an analysis of 1978 data from a 10-percent stratified probability sample survey of migrant agricultural workers in Wisconsin. The health behaviors and medical utilization patterns of workers' children were examined and, whenever possible, were compared with those of Hispanics and other rural families. The health utilization patterns of Hispanics in the migrant stream were compared with Hispanics who had settled permanently in Wisconsin. (The author's summary of the project findings, under same title, is separately available as NTIS No. PB83-172726.)

101. Slesinger, Doris P., Bruce A. Christianson, and Eleanor Cautley. (1986, January). Health and mortality of migrant farm children. Social Science and Medicine 23(1), pp. 65-74. (Grant No. HS04368).

The authors report findings supporting the view that children of migrants are at substantially greater risk of health problems and early mortality when compared with children of the general population. This study found that less than half of migrant children under age 16 received the recommended annual physical checkup. Only one-third of migrant children under age 16 had received an annual dental checkup compared with 50 percent of children in the total population. When levels of chronic health conditions for migrant children and those reported for children in a national survey were compared, the results suggested that the incidence of chronic conditions was roughly several times greater among migrant children. Further, the data suggested that childhood mortality was 1.6 times higher among migrant children than for children in the U. S. population. Further analysis showed the level of mortality to be proportionally lower for children born to women who spoke English and higher for low birthweight infants. But surprisingly, the most important characteristic related to mortality of children was whether or not the mother smoked. If smoking is considered as a type of high-risk behavior, future studies should give closer attention to studying the impact of parental risk-taking behaviors on childhood morbidity and mortality experience.

102. Slesinger, Doris P., and Yoshitaka Okada. (1984, Fall). Fertility patterns of Hispanic migrant farm women: Testing the effect of assimilation. Rural Sociology 49(3), pp. 430-440. (Grant No. HS04368).

This article summarizes findings from a 10-percent stratified random sample survey of migrant Hispanic farm women conducted in 1978 in Wisconsin by bilingual interviewers. Interviews with the women revealed that they have more children than other women in the United States, they bear children at younger ages, have greater infant mortality, and use fewer contraceptive techniques. Results showed that the variable most strongly associated with live births was age; when age was controlled, however, education was the main predictor. When the effects of both age and education were controlled, bilingual capacity also contributed to explaining births. Education, on the other hand, explained most of the variance in the expected number of children. It was concluded that high fertility patterns are likely to continue among migrant farm women until the level of education improves for the children, thus increasing their bilingual capacity and improving their occupational opportunities.

103. Stanford University. (1974). The Effect of the Livingston Health Center on Its Community. (NTIS No. PB-236 153; Contract No. HSM 110-72-178).

This report describes the development of the Livingston Community Health Services Center as a community-controlled primary care delivery center in a nonurban area. The operational and financial difficulties faced by the center in its effort to be self-supporting are discussed in detail.

104. Stokes, Joseph, III. (1983). Impact of EMS (Emergency Medical Services) System Development in Rural Areas. NTIS No. PB85-199727; Grant No. HS03826).

Findings are reported from a project that examined the utilization, treatment, and results of emergency cardiac care in three rural EMS systems with different levels of sophistication: a basic life support system in western Massachusetts, a system in West Virginia in transition to paramedic-staffed advanced life support, and a fully implemented advanced life support system in Cape Cod, Massachusetts. Procedures for collecting complete and accurate data from each operating research setting were established, including full cooperation from ambulance systems, hospitals, and health departments. This report presents information about the care of heart attack victims in rural areas, the effectiveness of regional EMS systems in improving cardiac care, and the extent to which each of the elements that comprise the system contribute to lowering mortality. The author concludes that, because rural areas are characterized by longer response times, fewer calls per technician (and therefore less field experience), and higher costs per run, it is important to understand the extent to which the mandates of the Federal EMS program, designed primarily for high population density areas, can be expected to improve cardiac care in rural settings.

105. Sytkowski, Pamela A., Ralph B. D'Agostino, Albert J. Belanger, Kevin S. Bettencourt, and Joseph Stokes, III. (1984, March). Testing a model that evaluates options for rural emergency medical service development. Medical Care 22(3), pp. 202-215. (Grant No. HS03826).

This article examines EMS system inputs, as well as the process in caring for the suspected cardiac patient, using data from 92 EMS systems in three geographically distinct and physically dissimilar regions. A consistent and significant relationship was found between the probability of patient survival and cardiac disease severity, age, sex, the presence of a life-threatening arrhythmia, health care resources available to the EMS system, and citizen-initiated cardiopulmonary resuscitation. Factors with the greatest influence on cardiac survival were tested to see if expected increases in survival occurred with incremental changes in the factors. Through the use of the model, it was shown that a 10-percent increase in citizen-initiated CPR could be expected to increase the probability of survival for the cardiac arrest patient by 1 to 2 percent and to improve the odds ratio by 9 percent. A similar increase in the probability of survival could be brought about by a unit change in the available community health resources. The model indicated that the presence of a paramedic could be expected to increase the chance

of survival for a cardiac patient by 2 to 9 percent and improve that patient's odds ratio by 42 percent. The model provides a means by which EMS physicians and directors, health care planners and policy advocates, and other individuals interested in improving the effectiveness of rural EMS systems can determine which variables among those describing the unique and specific characteristics of a rural community could most influence cardiac survival.

106. Sytkowski, Pamela A., Michael W. Pozen, and Ralph B. D'Agostino, (1981, May). Analytic method for the evaluation of rural emergency medical service development. Medical Care 19(5) pp. 526-546. (Grant No. HS03826).

The authors present an analytic method for assessing the marginal effect of incremental changes in rural emergency medical services on cardiac mortality, morbidity, health care system utilization, and EMS system process and performance. The method discussed incorporates a model of the EMS system specifying five sets of interactive variables that characterize EMS system development and effectiveness. The contribution of each of these sets of interactive variables on the four outcome variables listed above is quantified for three target populations: those who utilize the EMS system, all hospitalized patients with acute ischemic heart disease independent of EMS system use, and the population of all patients dying from acute ischemic heart disease on a community-wide basis. By including in the model those factors unique to rural areas--such as scarcity of fiscal and health care system resources, geographical constraints, and the skewed severity of casemix due to the clinical and socioeconomic conditions found among rural patients--the analytic method quantifies and helps to explain the impact of these factors and the limitations they impose on the EMS system. Health policy and planning applications are also considered.

107. Utah, University of. (1976, March). Utah MEDEX Project. (NTIS No. PB-267 656; Contract No. HRA 106-74-058).

The experience and outcomes of the Utah MEDEX Project are described in terms of improvement in primary care service delivery to the State's underserved rural areas. The report also presents information on the background and design of the project, which was initiated in 1971 as an experiment in providing immediate aid to medical practitioners in remote areas.

108. Wempner, Jon D., Edward D. McCormick, and Juli L. Kane. (1974). A Bi-Directional Cable Television System to Support a Rural Group Practice of Family Medicine. (NTIS No. PB-240 562; Contract No. HSM 110-72-386).

Results are presented from a pilot study that investigated the utility of a telecommunications system in a rural group practice of family medicine. A two-way audio-visual communications system, transmitted via coaxial cable, was developed to link two clinics and a rural community hospital 13 miles away. During

1973, 197 medical transmissions occurred. These transmissions were analyzed by location, participants, and purpose of transmissions. Transmissions were also classified and tabulated according to the probable communication alternatives had the transmissions not occurred; and the impact of the transmissions on changes (in medical care and patient management) and benefits (financial and medical) was compared with the alternatives.

109. Williams, Albert P., William B. Schwartz, Joseph P. Newhouse, and Bruce W. Bennett. (1983, October 20). How many miles to the doctor? The New England Journal of Medicine 309(16), pp. 958-963. (Grant No. HS03808).

The authors use detailed information from 16 States to determine the distance that residents of outlying areas (or towns of less than 25,000, outside metropolitan areas) must travel to receive various types of medical care. For both 1970 and 1979, approximately 80 percent of such residents lived within 10 miles driving distance of some physician and 98 percent lived within 25 miles. Most of the remaining 2 percent lived in areas so sparsely settled that physicians would not find them economically attractive as practice locations. During the 1970s, the driving distance of the studied population from medical and surgical specialists was substantially reduced. The greatest improvement occurred for the specialties that had the largest percentage increase in their numbers. The authors concluded that, as the physician pool expanded further during the 1980s, geographic access to specialty care for rural and small town residents should show improvement. However, this improvement might not suffice to meet what some consider the medical need of those who are geographically isolated or economically deprived.

110. Williams, Carolyn A. (1977, June). The Family Nurse Practitioner in North Carolina--PRIMEX. (NTIS No. PB-269 940; Grant No. HS01333).

Data are presented from a project that trained family nurse practitioners to respond to the health care needs of medically underserved rural areas in North Carolina. The training program consisted of 6 months of didactic work followed by a 6-month preceptorship. Data were collected on the students on entry; at graduation; and for some, at one or two time periods subsequent to graduation. Additionally, data were obtained from administrators of the practice settings in which the graduates worked through on-site interviews and self-administered protocols and from physician preceptors by self-administered protocols. Over one-half of the graduates of this program were employed in rural areas. The national average for employment of family nurse practitioners in rural areas was 37 percent. Graduates who were employed in private practice were more satisfied with their work; the doctors who employed them also reported they were satisfied. Salaries for program graduates ranged from \$8,300 to \$16,700. This study also found that family nurse practitioners from the University of North Carolina program were accepted in rural North

Carolina and that they sought work in the rural area for which they were trained.

111. Wolfe, Harry, Larry Shuman, and Edmund Ricci. (1978, September). Regional Allocation of High Cost Health Services. (NTIS No. PB-287 364; Grant No. HS00714).

The authors report findings from a study of the emergency medical services delivery system in a 12-county region of Pennsylvania that included Pittsburgh and several rural counties. Medical, sociological, and operational components of the system were evaluated by a multidisciplinary team. The research emphasizes the need to develop technological planning methodologies for planning cost effective regional EMS systems.

112. Wright, Diana. (1978). Changes in utilization patterns in a National Health Service Corps community. [Unpublished final report]. National Center for Health Services Research, Hyattsville, MD. (Grant No. HS02533).

How introduction of a National Health Service Corps site affected the health care utilization patterns of a rural Utah community was measured. Households in the NHSC community and in a control community were surveyed in 1971. The surveys were repeated yearly over a 5-year period, using the same households as much as possible, and changes in utilization patterns were measured.

113. Wyatt, William. (1977, January). Experimental Health Services Delivery Systems: Western South Dakota. (NTIS No. PB-272 220; Contract No. HSM 110-72-379).

The author describes an experimental community-level project designed to improve health care delivery in remote areas of South Dakota between 1972 and 1976 through creation of a health services delivery corporation. The role of this autonomous corporation in identifying needs and developing links between local components is discussed in terms of its organizational and corporate development activities, internal management and operations, and establishment of a health services data system.

Current Projects

114. Ball, Judy. (In preparation). [Characteristics of disproportionate share hospitals]. Center for General Health Services Intramural Research, Agency for Health Care Policy and Research.*

The study will assess the implication of specific refinements to the definition of "disproportionate share" hospitals--those that treat a disproportionately large share of Medicaid patients and Medicare beneficiaries receiving Supplemental Security Income payments. The analysis will profile disproportionate share hospitals, as currently defined, with respect to patient and hospital characteristics and compare the characteristics of urban

and rural hospitals that qualify for the disproportionate share payment adjustment. Similarities and differences between disproportionate share hospitals and those not so designated will be examined.

115. Barmes, David E. (In preparation). [International collaborative study of oral health outcomes]. (Grant HS05640).

This project is a collaborative study by the World Health Organization that is assessing socioeconomic, life style, and health care delivery systems in seven industrialized and three developing countries in order to improve the effectiveness of and access to oral health care. Among the systems being studied is the U.S. Indian Health Service program to provide health and medical care to Native Americans living on or near reservations.

116. Deprez, Ronald D. (In preparation). [Health services impact of CHC use in rural Maine]. (Grant No. HS05756).

A telephone survey, using a modified random digit dialing methodology, is being conducted with participants selected from towns within a 10-mile radius of the 18 federally certified community health centers in Maine. Providers are to be surveyed to supplement information obtained from the Bureau of Medical Services biannual survey of Maine physicians and the Maine Ambulatory Care Coalition. Information is being collected from the Maine 100-percent uniform hospital discharge data set and Maine's Blue Cross claims file.

117. Ferketich, Sandra. (In preparation). [Multilevel practice model for rural Hispanics]. (Grant No. HS06801).

This research proposes to evaluate the success of a three-tiered community-level model of nursing care delivery--the Comprehensive Nursing Practice Model--among Hispanics in a rural community. The model will be put into operation in Pinal County, Arizona. The demonstration component will develop and implement three nursing interventions: personal preventive nursing, organized indigenous caregiving, and community empowerment. The focus of both the model and the interventions is on improving the health of the population by directing the interventions to individuals and families, groups, and the community.

118. Frame, Paul. (In preparation). [Controlled trial of a health maintenance tracking system]. (Grant No. HS06283).

This project will compare the effects of a computerized tracking system for seven specific health maintenance procedures with a manual (flowsheet-based) system in four primary care offices in rural western New York State. The investigator will test the hypothesis that the computerized system will be better utilized by physicians than the manual system and that patient involvement with health maintenance and compliance with physician recommendations will be improved.

119. Konrad, Thomas. (In preparation). [The rural HMSA physician retention study]. (Grant No. HS06544).

The purpose of this investigation is to provide information about physicians currently in health manpower shortage areas with an emphasis on physicians in the National Health Service Corps in rural areas. Besides identifying recent physician entrants into rural practice, the study will also attempt to define the determinants of recruitment and retention of rural practice physicians and address methodological and conceptual concerns involved in measuring retention of physicians in rural areas.

120. McConnel, Charles. (In preparation). [Urban/rural differences in elderly use of long-term care]. (Grant No. HS06197).

This study will establish the extent and determinants of urban/rural differences in survival and utilization of health and community based services by the elderly. Data from the Longitudinal Study of Aging, the census of population, the national death index, and the Bureau of Health Professions Area Resource File will be linked. If the thesis of this study is proven, it should be possible to demonstrate that rural elderly who are older than urban aged need to utilize health services at the same or higher rate than the urban elderly.

121. Mitchell, James. (In preparation). [Health care utilization among the rural elderly]. (Grant No. HS05381).

A sample of rural poor and largely black elderly will be found by sampling census enumeration districts in 10 officially designated rural counties of eastern North Carolina. Households will be contacted to obtain the socioeconomic status characteristics and identify those over 65. All those over 65 who are identified will be asked to complete a questionnaire to elicit basic information on health status and propensities for alternative care, use of alternative care, or use of alternative and formal medical care systems. All respondents who use alternative forms of care or would be inclined to use it will then be interviewed twice at home using in-depth questionnaires.

122. Mowery, Ann. (In preparation). [Local and nonlocal hospital use by rural Iowans]. (Grant No. HS06790).

This project will use a cross-sectional analysis of 170,000 hospitalizations in 1988 to describe the extent to which residents of rural Iowa communities with small hospitals travel to more distant urban hospitals for care. The characteristics of those who seek hospital care outside their communities will be analyzed as well as the characteristics of the hospitals themselves in order to ascertain the determinants of rural consumer choice between local and distant facilities.

123. Moynihan, Christy. (In preparation). [Gastroenteritis patient outcomes research]. (Contract No. 282-90-043).

The investigator will evaluate the available literature and collect data on pediatric gastroenteritis. The data will be analyzed to evaluate variations in treatment, outcomes, and resource use among the study population, which will include American Indians and Alaska Natives living in rural areas.

124. Mueller, Keith J. (In preparation). [A study of access to medical care among the urban/rural indigent in Nebraska]. (Grant No. HS05760).

The number of medically indigent persons in Nebraska and their geographic distribution will be determined. There will be a particular focus on rural counties. The relationship between the economic conditions of the State's 93 counties and the incidence of medical indigence will be examined. This research will identify changes in the number of uninsured since the 1982-83 recession and financial crisis in the agricultural economy. Data will be gathered through telephone surveys. Problems of access among the uninsured in a rural area will be identified and compared with the access to care for the medically indigent in urban areas. This research will also develop a model to forecast increases in medical indigence resulting from changes in economic and demographic conditions within counties.

125. Rizzo, John. (In preparation). [Is Medicare a "bad deal" for rural hospitals?]. Center for General Health Services Intramural Research, Agency for Health Care Policy and Research.*

This study attempts to address the need for multivariate evidence on how Medicare involvement affects financial performance in rural hospitals and whether this relationship differs between rural and urban hospitals. The author uses measures of profitability broader than prospective payment system profits in order to investigate how Medicare reimbursement to rural hospitals compares with other forms of third-party payment. Preliminary results show that Medicare involvement is not significantly related to overall profitability in rural hospitals, which suggests that they may be able to mitigate patient care revenue shortfalls to some extent by increasing revenue from nonpatient care revenue sources.

126. Rosenblatt, Roger. (In preparation). [Practice variations in prenatal and intrapartum care]. (Grant No. HS06166).

In a 3-year study, a selected random sample of both urban and rural obstetricians, family practitioners and nurse midwives who provide prenatal care (N=269) will be obtained. Using a "physician encouragement network," participants will be recruited into the study and provided information on demographics, practice arrangements, medical environment, malpractice experience, and current obstetrical practice. Ten low-risk patients (defined rigorously) will be selected for the study and their charts abstracted for various components of prenatal care and charges. Multivariate analysis of the effects of specialty, urban/rural location, prior malpractice experience, hospital setting, and

other demographic features upon resource use and costs are expected to be performed.

127. Selby, Maija. (In preparation). [Nursing interventions to improve EPSDT utilization]. (Grant No. HS06507).

The long-term goals of this study are to improve health and reduce costs of care for children of low-income families by increasing utilization of a comprehensive early periodic screening, diagnosis, and treatment program in North Carolina known as UPSTATE. The specific aim of the study is to test the effectiveness, cost effectiveness, and efficacy of public health nursing interventions intended to improve use of UPSTATE in rural areas of the State, where utilization rates are lowest. The interventions are designed to address predisposing factors specific to the target population.

APPENDIX: AHCPR-Supported Contracts and Grants, by period funded, 1968-90

<u>Investigator/contractor</u>	<u>Title of project</u>	<u>Project number</u>	<u>Period funded</u>
<u>1968</u>			
Breslow, Lester UCLA School of Medicine Los Angeles, CA	California Health Services Research Center	HS00234	06/01/68-11/30/72
<u>1969</u>			
Elwood, Paul Interstudy Excelsior, MN	Health Services Research Center	HS00471	02/01/69-02/29/76
Logan, Eddie Milton Olive, III Memorial Corp. Lexington, MS	Ecology of Migrant Peoples-- Mississippi	HS00422	04/01/69-06/30/75
New Mexico, Univ of Albuquerque, NM	Manpower Models of Rural- Urban Linkage for Improved Health Services	HSM 110-69-241	06/11/69-01/31/74
<u>None started in 1970</u>			
<u>1971</u>			
Arkansas Health Systems Management Univ of Arkansas Little Rock, AR	Experimental Health Services Planning and Delivery System	HSM 110-71-229	06/29/71-09/30/76
Mon Valley Health and Welfare Council Monessen, PA	Experimental Health Services Planning and Delivery System	HSM 110-71-254	06/29/71-09/30/76

1972

Isaacs, Gertrude Frontier Nursing Service Wendover, KY	PRIMEX Family Nurse Training Program in Rural Areas	HS00885	03/01/72-06/30/76
Dartmouth Medical School Hanover, NH	Two-Way TV to Support Physician Extenders in Dermatology and Speech Therapy	HSM 110-72-387	06/29/72-10/12/73
Health Development Association of Northeastern Kentucky Morehead, KY	Experimental Health Services Delivery System and Emergency Medical Services Component	HSM 110-72-301	06/26/72-12/31/76
Lakeview Clinic Waconia, MN	Bi-Directional Cable TV System to Support a Rural Group Practice	HSM 110-72-386	06/29/72-03/28/74
⁴ Pope, Fergus Appalachian State Univ Boone, NC	North Carolina Region D Health Maintenance Project	HS01086	06/30/72-06/30/74
Stanford Univ School of Medicine Stanford, CA	Empirical Analysis of Evaluation of a Health Care Delivery System/Management Information System	HSM 110-72-178	04/27/72-03/02/74
Western Health System, Inc. Rapid City, SD	Experimental Health Services Delivery System	HSM 110-72-379	06/28/72-12/31/76
Wolfe, Harvey Univ of Pittsburgh Pittsburg, PA	Regional Allocation of High Cost Health Services	HS00714	03/01/72-03/31/77

1973

Dettman, Prentiss Univ of Nebraska Medical Center Lincoln, NE	Evaluation of Remote Radiographic Communications	HS01210	06/30/73-12/31/75
Little, Arthur D., Inc. Cambridge, MA	Evaluation of EMCRO Program- Implementation Phase	HSM 110-73-526	06/30/73-04/30/76
Williams, Carolyn A. Univ of North Carolina Chapel Hill, NC	Family Nurse Practitioner in North Carolina	HS01333	06/27/73-03/31/77
<u>1974</u>			
Batalden, Paul B. Interstudy Excelsior, MN	Innovative Technology in a Rural Health Care System	HS01591	06/30/74-11/30/76
Castle, Charles H. Univ of Utah Salt Lake City, UT	Salmon-Challis Medical Communications Project	HS01481	04/01/74-03/31/77
Lucas, Fred Univ of Missouri Columbia, MO	Automated Physician's Assistant	HS01571	06/30/74-09/30/75
Miles, David L. Lawrence County Hospital Moulton, AL	Health Care Evaluation Project	HS01568	06/30/74-09/30/77
MITRE Corp. McLean, VA	Analysis of Primary Care Health Delivery in Isolated Rural Areas	HRA 106-74-182	06/29/74-09/30/77
Utah, Univ of Salt Lake City, UT	Impact of MEDEX Physician Assistants on the Health Care Delivery System	HRA 106-74-058	06/29/74/11/30/76

1975

Shortell, Stephen
Univ of Washington
Seattle, WA

HS01978

08/14/75-08/31/81

University of Washington
Health Services Research
Center

Roth, Irvin J.
Chicago State Univ
Chicago, IL

HS01957

06/30/75-06/29/76

The Delivery of Rural EMS--A
Spatial Analysis

1976

Chicago, Univ of
Chicago, IL

HRA 230-76-096

02/26/76-11/30/79

Analysis of National Survey
Data on Access to Medical
Care

Greene, Sandra
Duke Univ
Durham, NC

HS02320

06/30/76-06/29/77

Medical Care Utilization
Patterns in a Rural Area

Kane, Robert
Univ of Utah
Salt Lake City, UT

HS02533

06/30/76-06/29/77

Impact of a NHSC Site on
Rural Utilization Patterns

Miners, Laurence A.
Univ of North Carolina
Chapel Hill, NC

HS02417

06/30/76-12/31/77

The Family's Demand for
Health: A Rural
Investigation

Pierskalla, William
Univ of Pennsylvania
Philadelphia, PA

HS02577

10/01/76-03/31/82

Health Care Management
Center

Risley, Todd
Univ of Kansas
Lawrence, KS

HS02510

06/30/76-12/31/79

An Empirical Basis for
Nursing Home Meal Service

1977

Kviz, Frederick J.
Univ of Illinois
Medical Center
Chicago, IL

HS02778

08/01/77-07/31/80

Need and Use of Health
Services in Underserved
Areas

Miller and Byrne, Inc. Hyattsville, MD	Review and Analysis of State Legislative and Reimbursement Practices of Physician Assistants and Nurse Practitioners	HRA 230-77-011 /Task 1	09/28/77-01/04/78
Miller and Byrne, Inc. Hyattsville, MD	Research Synthesis and Workshop in Evaluation and Research in Rural Health Care Programs	HRA 230-77-011 /Task 2	04//01/77-06/21/78
Myrick, Justin A. Georgia Institute of Technology Atlanta, GA	Rural Volunteer Emergency Medical Coordinators	HS02507	09/01/77-08/31/80
National Rural Center Washington, DC	Primary Health Practitioners: A Research Agenda	HS02829	03/15/77-12/31/77
Visiting Nurse Association Burlington, VT	Demonstration of Computerized Decision Support System in a Nurse Practitioner-Staffed Rural Health Clinic	HRA 230-77-112	09/29/77-07/31/81
Wiese, Helen J. C. Univ of Kentucky Lexington, KY	Disease Prognosis and Resources Allocation in Haiti	HS02913	09/01/77-11/30/78
<u>1978</u>			
Christianson, Jon B. Montana State Univ Bozeman, MT	Economic Issues in Reduction of Rural Hospital Capacity	HS03374	09/30/78-12/31/79
Perry, Henry Maine Medical Center Portland, ME	Deployment and Career Trends of Physician Assistants	HS03014	07/01/78-12/31/80

Puskin, Dena S. Finger Lakes Health Systems Agency Rochester, NY	Development and Use of Expenditure Data for HSAs	HS03459	09/30/78-06/30/80
System Sciences, Inc. Bethesda, MD	Evaluation of Findings from Nurse Practitioner and Physician Assistant Studies	233-78-3015	09/30/78-02/28/90
<u>1979</u>			
Farley, Dean E. Princeton Univ Princeton, NJ	A Study of Investment Behavior in Community Hospitals	HS03674	07/01/79-06/30/81
Lewin and Associates Boston, MA	Synthesis and Dissemination of Health Services Research for State and Municipal Health Leaders	233-79-3018	09/30/79-01/31/84
Stokes, Joseph III Boston Health and Hospitals Boston, MA	Impact of EMS System Development in Rural Areas	HS03826	09/30/79-12/31/82
Western Interstate Commission for Higher Education (WICHE) Boulder, CO	Synthesis and Dissemination of Health Services Research for State and Municipal Health Leaders	233-79-3025	09/30/79-10/31/82
Williams, Albert P. RAND Corp. Santa Monica, CA	Location of Physician Specialists in Rural Areas	HS03808	09/15/79-12/31/80
<u>1980</u>			
Durmaskin, Bettina West Virginia Univ Morgantown, WV	Impact of Changes in UMW Funds on West Virginia Miner Clinics	HS04317	09/01/80-12/31/81

Grundy, Betty L. Univ of Pittsburgh Pittsburgh, PA	Telehealth in Anesthesia: Model for a Network	HS04105	06/01/80-05/31/82
Konrad, Thomas Univ of North Carolina Chapel Hill, NC	PGM Effects on Coalfield Clinics	HS04313	09/01/80-11/30/81
Mudgett, Carol Univ of Wisconsin Milwaukee, WI	Navajo Ambulatory Care Utilization Patterns	HS04270	09/01/80-12/31/81
Silver, George A. Yale Univ New Haven, CT	Priorities for Research in MCH Services	HS04145	02/18/80-11/30/80
<u>1981</u>			
Nations, Marilyn Univ of Virginia Charlottesville, VA	The Cultural Context of Childhood Diarrhea	HS04437	03/01/81-06/30/82
Nichols, Andrew W. Univ of Arizona Tucson, AZ	Conference on Border Health Research Agenda	HS04527	02/01/81-07/31/82
Slesinger, Doris P. Univ of Wisconsin Madison, WI	Migrant Agricultural Workers in Wisconsin	HS04368	03/01/81-01/31/82
<u>None started in 1982</u>			
<u>1983</u>			
Moore, Patricia D. Johns Hopkins Univ Baltimore, MD	Utilization of Ambulatory Health Services by Hispanics	HS05011	07/01/83-06/30/84

1984

Shortell, Stephen M.
Northwestern Univ
Evanston, IL

A Study of Multiunit Health
Care Systems

HS05159

09/01/84-12/31/87

None started in 1985

1986

Castillo-Salgado, C.
Johns Hopkins Univ
Baltimore, MD

Mexican American Children:
Health Needs and Use of
Health Services

HS05565

04/01/86-05/31/87

1987

Barnes, David E.
World Health
Organization
Geneva, Switzerland

International Collaborative
Study of Oral Health
Outcomes

HS05640

06/01/87-05/31/92

50 Van Hook, Robert T.
National Rural Health
Association
Kansas City, MO

Conference Proposal: A
Research Agenda on Rural
Health

HS05785

02/01/87-01/31/89

1988

Mick, Stephen S.
Johns Hopkins Univ
Baltimore, MD

Rural Hospital Strategic
Management, Innovation, Cost

HS05998

09/30/88-09/29/90

1989

Deprez, Ronald D.
Medical Care
Development, Inc.
Augusta, ME

Health Services Impact of
CHC Use in Rural Maine

HS05756

03/01/89-02/28/91

McConnel, Charles Univ of Texas Dallas, TX	Urban/Rural Differences in Elderly Use of Long Term Care	HS06197	09/01/89-08/31/90
Mitchell, James East Carolina Univ Greenville, NC	Health Care Utilization among the Rural Elderly	HS05381	09/01/89-12/31/90
Mueller, Keith J. Univ of Nebraska Lincoln, NE	A Study of Access to Medical Care Among the Indigent in Nebraska	HS05760	06/01/89-12/31/90
Rosenblatt, Roger Univ of Washington Seattle, WA	Practice Variations in Prenatal and Intrapartum Care	HS06166	07/01/89-06/30/90
<u>1990</u>			
Ferketich, Sandra L. Univ of Arizona Tucson, AZ	Multilevel Practice Model for Rural Hispanics	HS06801	09/30/90-09/25/95
Frame, Paul S. Tri-County Family Medicine Cohocton, NY	Controlled Trial of a Health Maintenance Tracking System	HS06283	05/01/90-04/30/93
Konrad, Thomas R. Univ of North Carolina Chapel Hill, NC	The Rural HMSA Physician Retention Study	HS06544	09/30/90-12/31/91
Mowery, Ann E. Arizona State Univ Tempe, AZ	Local and Nonlocal Hospital Use by Rural Iowans	HS06790	09/01/90-08/31/91
Selby, Maija L. Univ of North Carolina Chapel Hill, NC	Nursing Interventions To Improve EPSDT Utilization	HS06507	04/01/90-03/31/94
Systemetrics, Inc. Santa Barbara, CA	Gastroenteritis Patient Outcomes Research	282-90-043	09/28/90-09/27/93

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